

# Machine and Tool BLUE BOOK

ESTABLISHED 1906



## December 1951

Special Report on  
Gear-making Machines

Planetary Thread Rolling  
Increases Production

European Trade Fairs

Washington News Letter

How's Business?

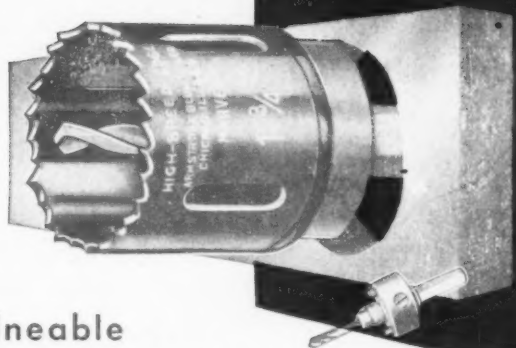


CONTENTS ON PAGE 5

# Cut...

## LARGE HOLES

...thru any machineable material up to 1 7/8 INCHES thick!



Here is a premium tool which makes it possible to saw holes in one short operation ... large holes which heretofore had to be laboriously machined "a-chip-at-a-time."

MARVEL High-Speed-Edge Hole Saws have strength to withstand the terrific peripheral strains of heavy duty operation in lathes, drill presses or portable power tools. They have a high speed steel cutting edge which is electrically welded to a tough, alloy steel body, high speed steel pilot drills, heavy hexagonal shanked arbors and sufficient set for deep drilling. They are self-aligning, as the larger diameter saws float on their arbors and are driven by double drive pins. They will saw round holes accurately in any machineable material.

MARVEL High-Speed-Edge Hole Saws come in 35 sizes, from 1/4" to 4 1/2". They are carried in stock by leading industrial distributors.

WRITE FOR BULLETIN ST-49



"MARVEL" has Always had the edge!

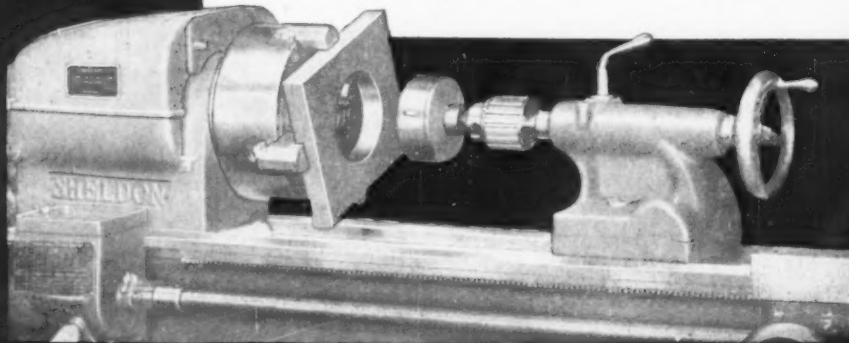


ARMSTRONG-BLUM MFG. CO.

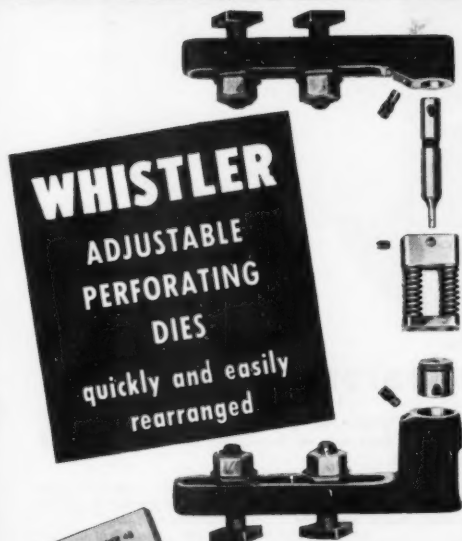
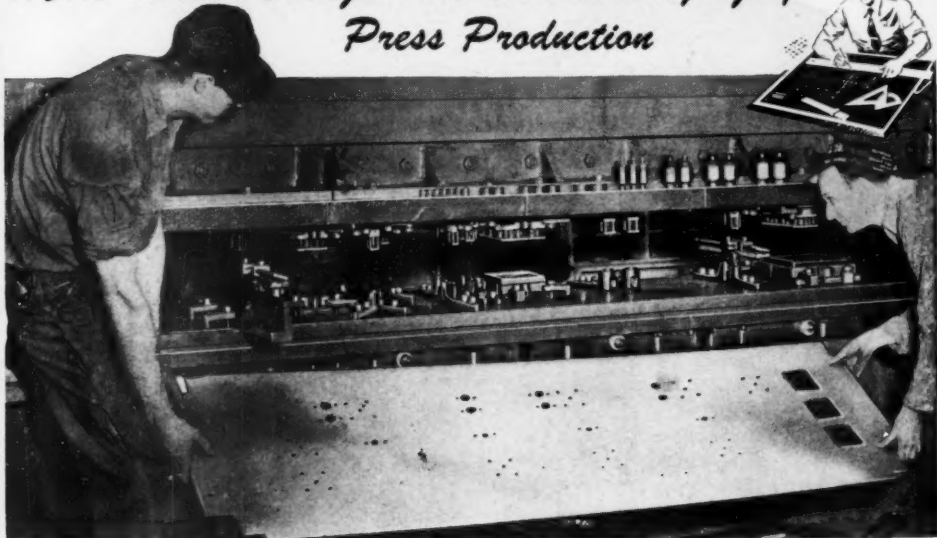
"The Hack Saw People"

5700 Bloomingdale Avenue

Chicago 39, U. S. A.



*Meet sudden change-orders without tying up  
Press Production*



Change-orders from the engineering department usually cause plenty of headaches in production...particularly where die piercing operations are involved.

But, if you're using Whistler Adjustable Dies, there is no lost time—no waiting—no extra die expense. The same dies are easy to rearrange to the new design. Add units from stock, or delete sizes and shapes no longer required. Arrange the new set-up right on the press.

Consider the savings in production time alone. Then think how continued re-use of the same dies in subsequent jobs writes off first cost.

Whistler Dies can be used in practically any press. All parts are interchangeable. Precision is assured on long or short runs. Closer centers permit fewer press operations.

Deliveries are quick...little or no waiting. Standard round punches and dies up to 3" are available from stock. Ovals, squares, rectangles and special shapes can be made up in a few days.



*Write*

for the Whistler  
Catalog today and  
get all the facts.

**S. B. WHISTLER  
& SONS, INC.**

760 Military Road • Buffalo 17, N. Y.



# Wade

No. 8A

## PRECISION LATHE

... a toolmaker's lathe, designed for versatility and fast, effortless operation. Built with all the rigidity and stamina required for carbide tools.

VARIABLE SPEED DRIVE • ELECTRIC TACHOMETER • AMPLE TORQUE  
 REAR STATION TOOL BLOCK • THREAD-LOCK SPINDLE NOSE (Patented)  
 AMPLE FRONT GUIDEWAY • FULL BEARING TAILSTOCK  
 COMPLETE ELECTRICAL SYSTEM

Can be had with stepless spindle speeds with ratio as much as 187 to 1.

Swing over bed, 8 1/2" • Distance between centers, 24"  
 Collet capacity, 1" • Taper standard for centers, No. 2 Morse  
 Tailstock spindle travel, 3 1/4" • Tool shank section 3/4" x 3/4"

SEND FOR CATALOG 8A

THE WADE TOOL CO., 51 River St., Waltham, Mass.

**HARDINGE**  
ELMIRA, N.Y.

# Style "S"

**SURE-GRIP Master Collets  
and Pads**



Multiple spindle automatics equipped with Hardinge Master Collets and Pads give solid collet performance—at low cost. Pads are interchangeable among different machines with same capacity. Available for all sizes of the following machines up to and including 3½" capacity:

CLEVELAND

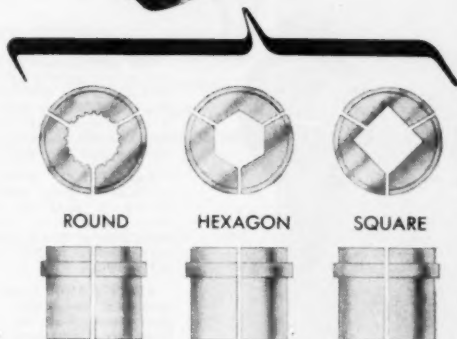
CONE

GREENLEE

GRIDLEY and ACME-GRIDLEY

NATIONAL ACME

NEW BRITAIN



ROUND

HEXAGON

SQUARE

Ask for Style "S" and Style "B" Bulletins  
which give all performance features,  
price savings, and ordering information.

**HARDINGE**  
ELMIRA, N.Y.

# ARMSTRONG



*Quality*  
**TOOLS**



*Not a cost, but an investment  
that pays year after year*

Buy ARMSTRONG TOOL HOLDERS and TOOLS for today's job and they will bring you added profits thru the years. With ARMSTRONG TOOL HOLDERS you will be permanently tooled up for whatever comes, for each is a multi-purpose tool that takes cutter-bits ground to many shapes. Each is an efficient tool, refined thru a half century of world wide use. Each has strength beyond any need, extra strength resulting from endless research and the most modern closely controlled manufacturing methods.

ARMSTRONG TOOL HOLDERS are inexpensive too, for they are produced in great numbers. They are instantly available because they are carried in stock by all leading supply houses in sizes and types for every operation on lathes, planers, slotters and shapers; for standard operations on turret lathes and screw machines. They are profitable in use because they permit the highest speeds and heaviest feeds, and "Save: All Forging, 70% Grinding and 90% High Speed Steel".

ARMSTRONG Lathe and Milling Machine Dogs are permanent tools too. They are drop-forged from special open hearth steels, are heat treated to extreme stiffness and toughness. They have alloy steel screws hardened at the tip to prevent up-setting and have double life, for hubs are made oversize to permit re-tapping.

ARMSTRONG Quality pays over and over again. Write for new S-48 catalog. It offers many opportunities to conserve profits.



## ARMSTRONG BROS. TOOL CO.

*"The Tool Holder People"*

5208 W. ARMSTRONG AVENUE • CHICAGO 30, ILL.

# Machine Tool BLUE BOOK Contents for December, 1951 Vol. 6, No. 12

As the editor sees it .....	103
Featured in this issue .....	105
Last minute Washington news .....	107
How's Business? .....	113

## FEATURE ARTICLES

Planetary thread rolling machine threads 18,000 pieces per hour .....	119
by H. J. Hogue	
Method of machining hard metals utilizes electrical energy .....	127
by John S. Roller	
Developments in European machine tools and accessories .....	
... as seen at recent trade fairs .....	138
by Paul Grodzinski	
Shot peening as a factor in the design of gears .....	163
by John C. Straub	
Chrome Carbides open new fields of application for metallic carbides .....	203
It's easy to bend .....	209
How to improve plant layout and the use of equipment . . . part 2 .....	223
by Dr. Thomas G. Willsin	

## DEPARTMENTS

Available literature .....	235	The Market Place for Employment and Sales Services .....	369
Modern tools in action .....	249	Mechanics through the ages .....	370
Shop hints .....	259	Products index .....	372
News of the Industry .....	263	Index to advertisers .....	378
What's new in metalworking .....	275		

## EDITORIAL STAFF

Wm. F. Schleicher, editor; H. Louis Purdy, new equipment editor; Gerald E. Stedman, field editor.

## BUSINESS STAFF

R. C. Van Kampen, president; Vincent C. Hogren, vice president; J. E. Hitchcock, vice president; M. L. Yonts, secretary; R. E. Goodwin, circulation manager

Hitchcock district managers are listed on page .....

333

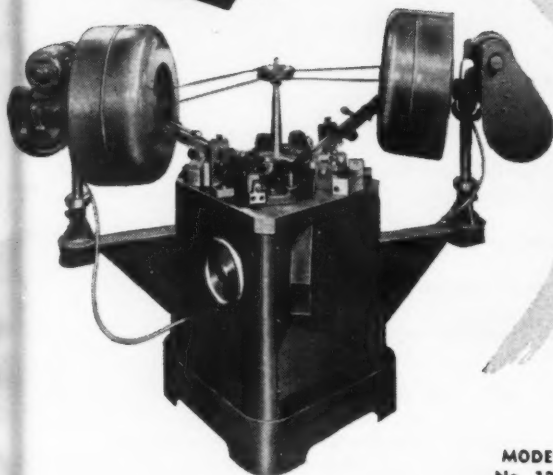
Accepted under section 34.64, P. L. & R, authorized office, Chicago, Ill.

Copyrighted 1951 by the Hitchcock Publishing Co., 222 E. Willow Ave., Wheaton, Illinois.



FOR SPEEDIER  
THREAD ROLLING  
TRY THE

ROLLMASTER



MODEL  
No. 125

### PLANETARY THREAD ROLLING MACHINE

PRODUCTION..... 25,000 Threaded parts per hour  
TOLERANCE..... Class 3  
DIE LIFE..... 3 to 5 MILLION pieces per set  
CAPACITY.....  $\frac{1}{4}$ "x2" Threads.

\*Also available for threading letter ring and spiral nails,  
stud bolts and many knurling, marking, serrating, necking  
and contour operations

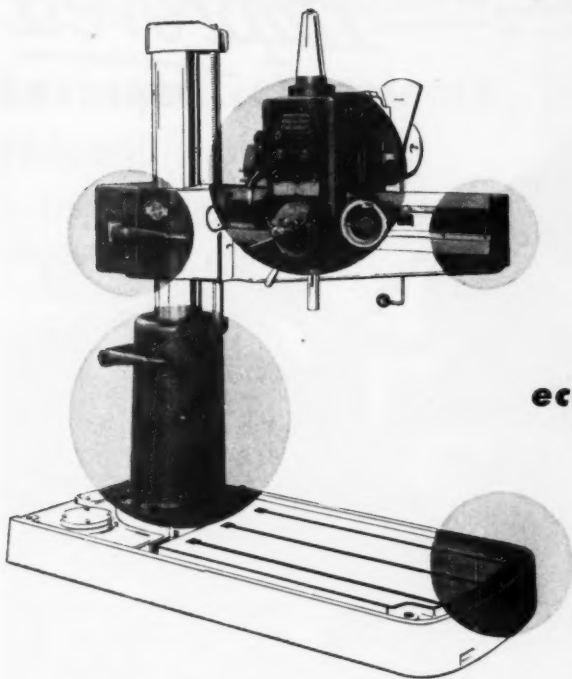
INFORMATION available on this machine and on the #200 ROLL-  
MASTER Planetary Thread Rolling Machine for threads  $\frac{1}{2}$ "x3"

**D. H. PRUTTON** Machinery Co.

5295 W. 130th ST.

CLEVELAND 11, OHIO

# feature-packed



***economy priced***

The new Canedy-Otto **CINCINNATI ROYAL RADIAL** (3-foot arm, 7-inch column) has the features you need to handle up to 90% of your drilling requirements. It combines low cost with such high-priced radial features as: all-gear head, automatically pressure lubricated, 9 spindle speeds (30 to 1 overall ratio), 6 power feeds, flame hardened transmission gears . . . all shafts mounted on anti-friction bearings . . . ground tubular steel column mounted on two Timken tapered bearings . . . simple, trouble-proof column and arm clamps . . . hardened and ground head rail on arm . . . extra heavy base. Catalog CO-15 on request.

**CANEDY-OTTO DIVISION**

**cincinnati lathe & tool co.** CINCINNATI 9, OHIO, U.S.A.

Grinding the anti-friction bearing diameter of a sleeve gear. This machine is a CINCINNATI FILMATIC 10" x 36" Plain Hydraulic Grinder.

*Improved*  
...improved  
Offered by



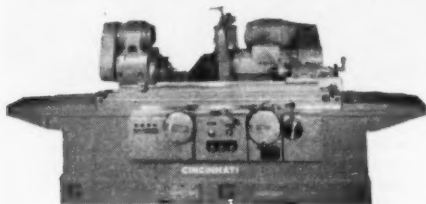
# *Performance*

## **operating convenience**

### **Cincinnati Filmatic 10" Plain Hydraulic Grinding Machines**

Performance tells the story... more convincingly than ever before by the improved CINCINNATI FILMATIC 10" and 14"-L Plain Hydraulic Grinding Machines.

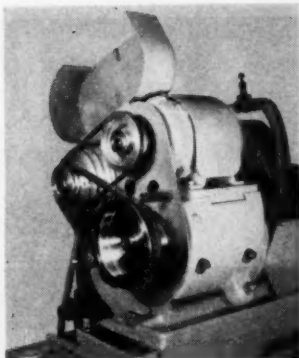
They have a new headstock, powered by an AC motor with built-in magnetic brake; all V-belt drive; eccentric counter-shaft for belt tension adjustment and changing the belt on the four-step pulley... bed is 2" lower, making it easier to load and unload the work...



CINCINNATI FILMATIC 10" x 48" Plain Hydraulic Grinding Machine. Catalog No. G-603 contains complete information.

# CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES  
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

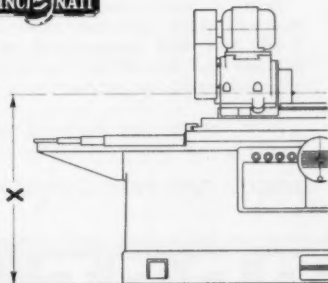
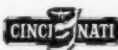


HEADSTOCK — New headstock, all V-belt drive... powered by AC motor... convenient device for shifting belt.

grinding wheel collets take 12" hole wheels, for continued usefulness on smaller machines after wear retards efficient grinding.

FILMATIC grinding wheel spindle bearings and other time-proved features have been retained. Complete specifications are listed in a new catalog No. G-603. We shall be glad to send you a copy.

CINCINNATI GRINDERS INCORPORATED  
CINCINNATI 9, OHIO

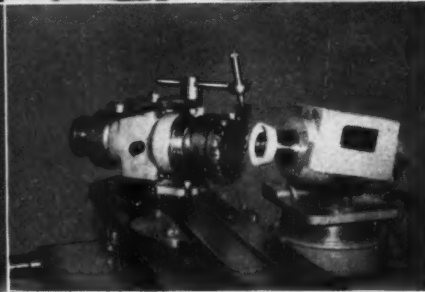
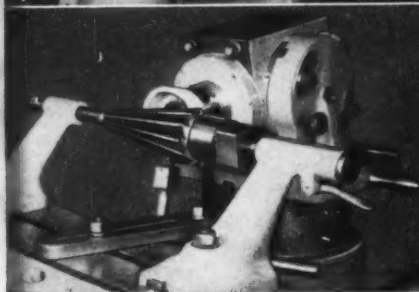
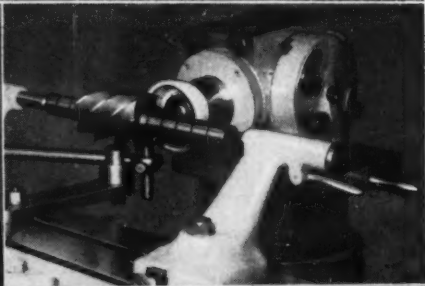
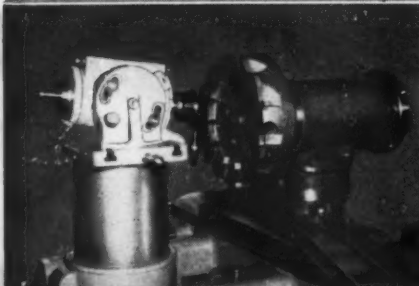


BED—Easier to position and remove work because dimension X has been reduced from 41½" to 39½".

# NEW

with new adjustment

## This POPE Motorized Tool and Cutter Grinder SPINDLE



Here's one you've always wanted — a totally enclosed, sealed lubrication, super precision 1 HP, 3600 RPM motorized tool and cutter grinding head, mounted on a new bracket that provides *angular adjustment in a vertical plane*.

POPE Spindles have the radial and axial rigidity to make wheels cut faster — spark out

quicker. Grinding time is reduced. Softer wheels can be used for cooler grinding and for producing the kind of cutting edge that stands up.

Make the most of your present grinders. Equip them with this new and better POPE Spindle.

Ask us to quote price and delivery.

**SPECIFY THIS POPE SPINDLE ON YOUR NEXT TOOL AND CUTTER GRINDER**

No. 71

# POPE

**POPE MACHINERY CORPORATION**

ESTABLISHED 1920

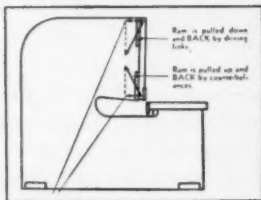
261 RIVER STREET • HAVERHILL, MASSACHUSETTS  
BUILDERS OF PRECISION SPINDLES

# Write for New Cincinnati Shear Catalog S-6d

*Keep up to date on Shearing!*

**Learn about...**

the exclusive features illustrated below—and many others.



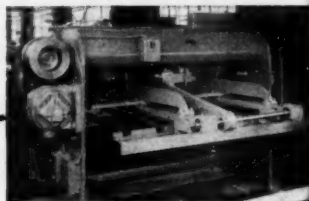
Cincinnati Non-Float Ram



Cincinnati Sure-Set  
Knife Aligner



Cincinnati Hydraulic Holddowns



Cincinnati Magnetic Sheet Support



**Just off the press** This up-to-the-minute, illustrated catalog will give you a complete description of the speedy, accurate All-Steel Cincinnati Shears in capacities from 12 gauge to 1¼-inch steel plate, in 4-foot to 24-foot lengths. Also, many special features for particular needs are illustrated and described.

**THE CINCINNATI SHAPER CO.**

CINCINNATI 25, OHIO U.S.A.  
SHAPERS • SHEARS • BRAKES



Want to reduce  
your TAP BILL  
50%? 59%?  
— even 75%?

**BLAKE**  
TAP SHARPENING  
EQUIPMENT  
DOES THIS  
FOR OTHERS



Ask for Bulletins 549 and 649

**EDWARD BLAKE COMPANY**

Black Diamond Precision Drill Grinders . . . Waltham Cutter Sharpeners . . .  
Waltham Thread Milling Machines . . . Surface Finish Standards.

**No. 6** in a continuing study  
of Tap performance records made  
by users of Blake Tap Sharpening  
Equipment.

### TAP PERFORMANCE

**Before Sharpening** Averaged only 600  
holes per tap when tapping 10-32,  
 $\frac{5}{16}$ " deep through hole (Class No.  
3 fit) in die cast aluminum. Stand-  
ard 2-flute Commercial Grd. spiral  
pointed tap used.

**After Sharpening on Blake Equipment**  
Tap reground with 18° hook in  
flute and spiral point increases  
tapped holes *per grind* to 12,000 —  
an increase of 2000% *per grind*.  
Average six grinds per tap before  
it is discarded as too small or too  
short in thread length. Total holes  
per tap: 72,000.

*Why Not You!*

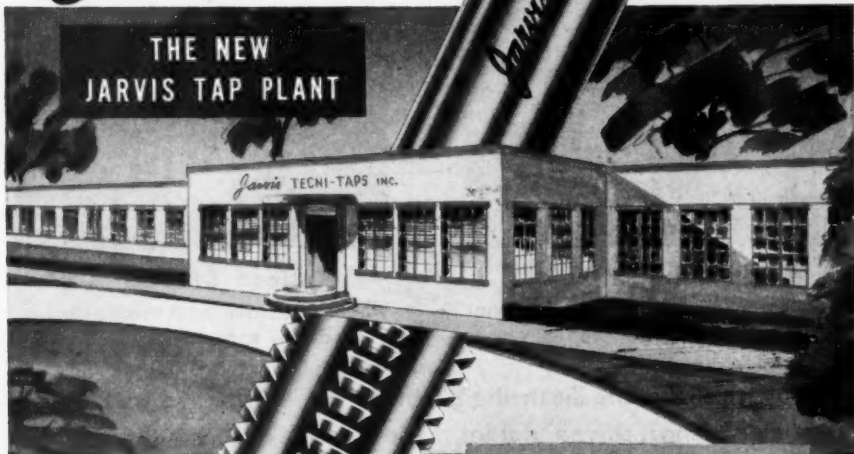
To get dollar-for-dollar value from your  
taps, you *must* sharpen them just as you  
do other cutting tools. The Blake Flute  
Grinder and the Blake Chamfer Grind-  
er provide you with fast, accurate, and  
economical means for grinding straight  
flutes, spiral points, and the chamfered  
ends of your taps — a sure means of  
reducing your tap bill.  
Investigate today.



440 CHERRY ST., WEST NEWTON 65, MASS.

# Jarvis

THE NEW  
JARVIS TAP PLANT



FOR  
SERVICE

FOR  
QUALITY

Machine  
Ground-from-the-Solid

## TECNI- TAPS

THE CHARLES L. JARVIS CO.  
MIDDLETOWN IN CONNECTICUT

TAPPING ATTACHMENTS • TECNI-TAPS • FLEXIBLE  
SHAFTS AND MACHINES • ROTARY FILES • TUNGSTEN  
CARBIDE REAMERS AND MILLS • DRILLS • BORING BITS

## *Why-* Flexible Shaft Driven Tools Are Easier To Handle



### **You Get This**

where you have only the tool  
to handle.



### **Instead Of This**

where you have both the motor  
and the tool to handle.

Just compare the illustrations above. It's easy to see why the flexible shaft driven tool (at the left) is easier to manipulate. The operator has less weight and bulk to carry. As a result, he can handle the tool more readily and with much less effort. That's why you'll do well to consider the advantages of an S.S.White flexible shaft drive when designing portable tools. For further details

### **WRITE FOR BULLETIN 5008**

It has the latest information and data on flexible  
shaft selection and application.



**THE S.S. White INDUSTRIAL DIVISION**  
**DENTAL MFG. CO.**



Dept. H. 10 East 40th St.  
NEW YORK 16, N. Y.

WESTERN DISTRICT OFFICE: Times Building, Long Beach, California

# For EVERY nut running operation...



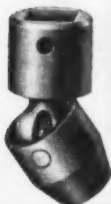
STRAIGHT WRENCHES



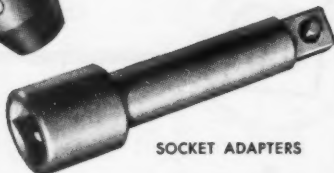
PLAIN SOCKETS



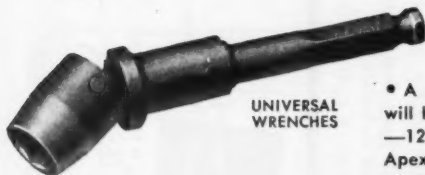
DRIVERS FOR SOCKET SCREWS



UNIVERSAL SOCKETS



SOCKET ADAPTERS



UNIVERSAL WRENCHES

**APEX  
IMPACT**

- Sockets
- Extensions
- Adapters
- Universal Wrenches

Here is a complete line of production tools—specifically designed to meet every nut running requirement—specifically built to withstand the strain and shock of impact tool operation.

Apex impact sockets, extensions, adapters and universal wrenches are available in thousands of stock types and sizes, each precisely machined from high carbon, electric furnace alloy steel, cold broached and heat treated to insure greater freedom from quick wear-out and breakage.

For production or maintenance nut running work, specify Apex—for longer service life, greater output per tool and lower tool costs.

• A note, on your company letterhead please, will bring your copy of the new Apex Catalog 29—122 pages of helpful data on more than 5,000 Apex impact tools. For special applications, just send sketch or blueprint for prompt quotation.

**APEX  
TOOLS**

sockets, extensions, adapters

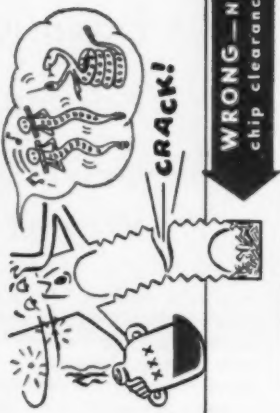
**THE APEX MACHINE & TOOL COMPANY**

1028 S. Patterson Blvd., Dayton 2, Ohio

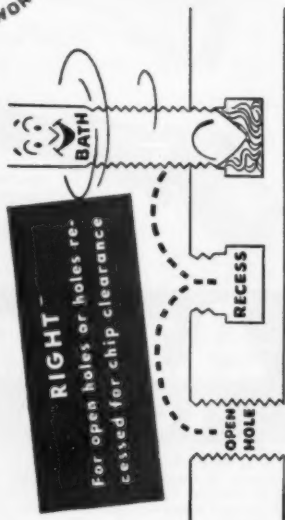
Power Bits, Insert Bits and Bit Holders, for Phillips, Frearson (Reed & Prince), Slotted, Clutch Head and Socket Head Screws • Hand Drivers for Phillips, Frearson and Clutch Head Screws • Two-Piece Drivers for Hex-Head Screws • Sockets, Extensions, Adapters and Nut Setters • Universal Sockets, Extension Wrenches and Adapters • Aircraft and Industrial Universal Joints • Self-Releasing and Adjustable Stud Setters • Safety Friction Tapping Chucks • Vertical Float Tapping Chucks.



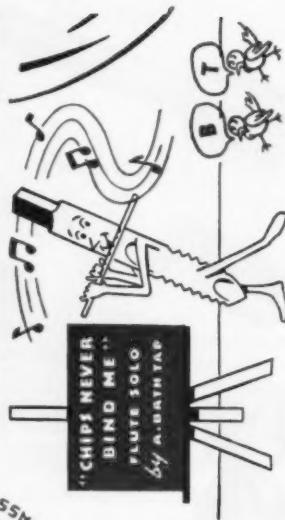
Two spiral pointed taps — with flutes clear and true,  
Had a different reaction to "pale mountain dew".



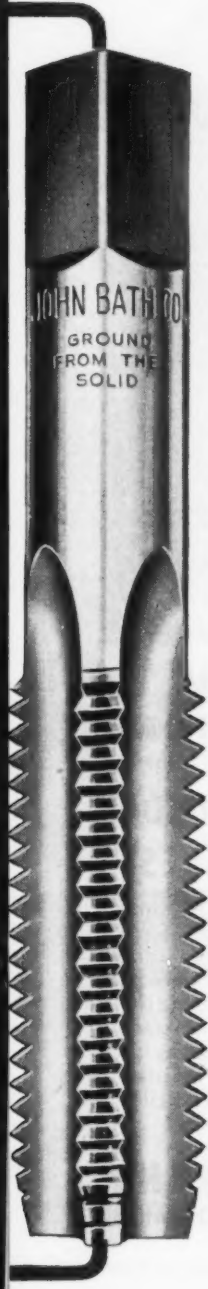
One tapped holes blindly — got "tight" by degrees,  
And jammed his O.D. with the "low-down" D.T.'s.  
(Damaged Threads)



The other, straight-fluted; would never touch "likker",  
He deflected the chips to thread the steel quicker.



Moral:  
To tap blind holes . . . you must have clear heads.  
Bath Taps give B.T.'s . . . which means . . . Better Threads.



## INSIST ON BATH TAPS . . . PROFIT BY THEIR PLUS-PERFORMANCE

The spiral-pointed, straight-fluted tap is the most efficient member of the machine tap family . . . when properly used. The angle ground into the flutes at the chamfer, deflects the chips, making this type of tap especially effective for threading open holes in steel or nickel. However, the spiral-pointed tap should never be used to tap blind holes

without sufficient chip clearance at the bottom.

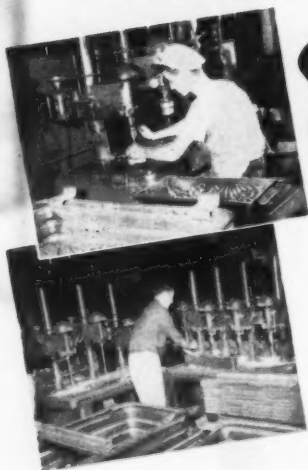
Proper tap selection and use is very important. It means economy in your toolroom. We will be glad to give you the benefit of our experience . . . to recommend the proper Bath ground thread taps for your particular jobs.

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

**JOHN BATH CO.** INCORPORATED  
14 Grafton St., Worcester, Mass.



**VERSATILE PRODUCTION TEAM  
SPEEDS SEQUENCE OPERATIONS**

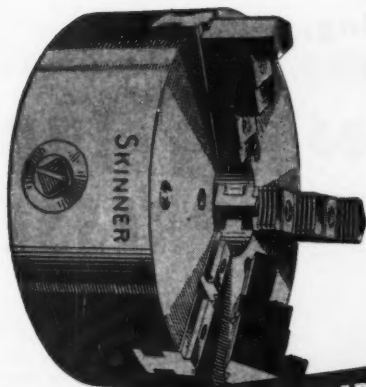


40<sup>TH</sup> YEAR  
**Atlas**

**MULTIPLE SPINDLE  
DRILL PRESSES**

It's too costly to change drills and tools for sequence operations. Save such labor time with 2, 3, or 4 spindle Atlas drills. Massive production tables, *exclusive* "floating drive" spindles with 4 ball bearings, steel to steel drive, wider column bearings, *exclusive* head positioning mechanism plus many other features help lower drilling costs. Send for latest catalog.

**ATLAS PRESS COMPANY**  
1250 N. PITCHER ST., KALAMAZOO, MICH.



## SKINNER SCROLL CHUCKS

*Sold by  
leading  
distributors  
in every  
industrial  
area*

Finest engineering, quality materials and latest production techniques are your assurance that nothing can surpass the quality of Skinner Chucks. Whether you are a builder or user of machine tools, you should be sure that none of the basic accuracy of your machines is lost through "second-best" chucking equipment. The Skinner trade-mark denotes "The Crest of Quality," and your nearby Skinner distributor is ready and willing to show you the quality features inherent in the complete Skinner line. Ask him for the Skinner Catalog, or write direct to the company.

HAND & POWER OPERATED MACHINE CHUCKS—AIR CHUCK EQUIPMENT  
—FACE PLATE JAWS—MACHINE VISES

## SKINNER INDEPENDENT CHUCKS

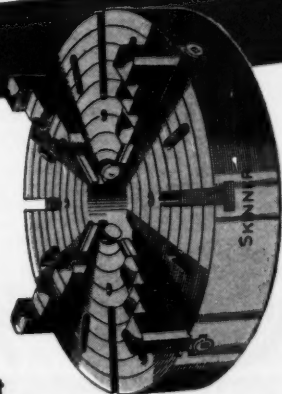
THE CREST



OF QUALITY

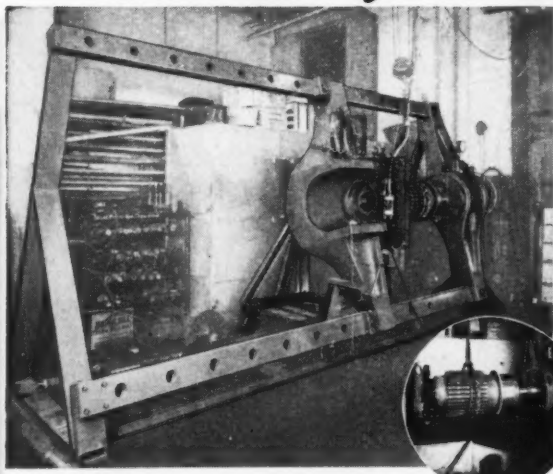
# THE SKINNER CHUCK CO.

341 Church Street, New Britain, Connecticut



**For Fast, Efficient Pressing,  
Bending, Forming, Straightening . . .**

# **New Rodgers FORCING PRESSES**



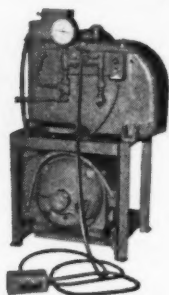
Rodgers 300 Ton, 75° Inclined, Stationary Forcing Press, one of many in the complete Rodgers line. In the application shown, the press is being used efficiently to press an armature shaft.

## **. . . With These Features of Construction and Operation**

**SEPARATE PUMPING UNITS**—Choose from individual hand-operated or power-driven pumps to operate any model Rodgers Forcing Press. **REMOTE CONTROL OF POWER PUMPS**—Operator can control press from any desired position. **REMOVABLE HYDRAULIC CYLINDER**—Cylinder is easily removed from head member to permit servicing or use for other power applications. **INDIVIDUAL FRAME UNITS**—Tracks, tension bars, abutment member and head member are all separate units to facilitate handling and erection of press. **EXPERTLY ENGINEERED AND CONSTRUCTED**—All units of Rodgers Forcing Presses are made strong, durable and dependable to give years of reliable service.

## **. . . In These Types and Sizes**

Rodgers Versatile Forcing Presses are available in portable or stationary models—horizontal, vertical, 75° or 90° inclined—100 to 600 tons—with hand-operated or power-driven pumps. In this broad selection, you'll find the ideal press to meet your requirements.



## **Separate Power Pump**

Select your press operating unit from hand-driven pumps or power-driven pumps. Shown is a Rodgers 2-cylinder Power Pump with remote control.

## **Send for New Catalog**

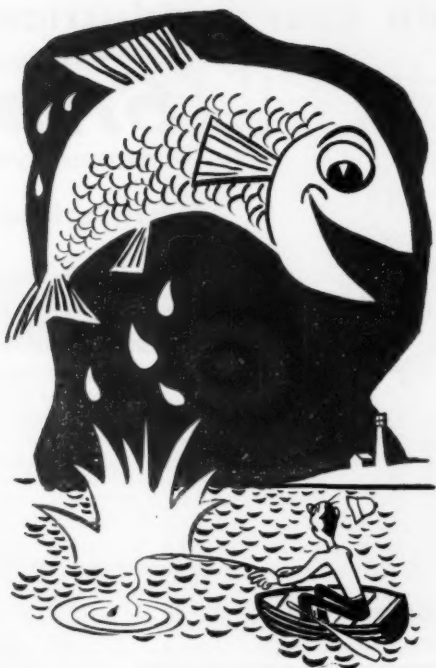
For full details and specifications on the complete line of Rodgers Forcing Presses send for Catalog 315.



# **Rodgers Hydraulic, Inc.**

7453 Walker St., St. Louis Park, Minneapolis 16, Minn.

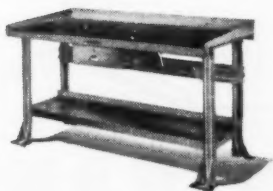
**HYDRAULIC POWER EQUIPMENT**



## A PRIZE ... IN ANY MAN'S LANGUAGE

**HALLOWELL**®

### STEEL WORK BENCH!



Everyone dreams of hooking the biggest fish . . . everybody wants a HALLOWELL Bench. They're both prizes in any man's language! . . . The man who buys a HALLOWELL likes its *standard-unit* design, which simplifies plant layout, its tough, steel construction which reduces maintenance and replacement for years to come, and its *trim*, good looks that improve shop appearance . . . The man who works at a HALLOWELL likes its smooth, *splinter-and-oil-proof* durable work surface, its rock-solid sturdiness and its convenience . . . Whether you buy or use work benches, you'll want to look over Bulletin 701.

WRITE FOR YOUR COPY TODAY

**-SPS- STANDARD PRESSED STEEL CO.**  
JENKINTOWN 52, PENNSYLVANIA

**Step-up your production with**



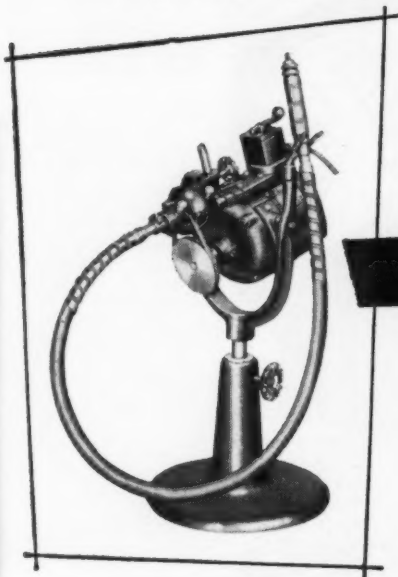
**Flexible Shaft Machines**

### BENCH MOUNTING

Here is convenient flexible shaft equipment that can be mounted on bench right near the work.

Portable to the extent that it can be taken from place to place. For steady, fast production, consider the bench-mounted flexible shaft machine as part of your production setup.

Model shown is three-speed mounted on swivel type adjustable bench column. Available in  $\frac{1}{2}$  H. P.

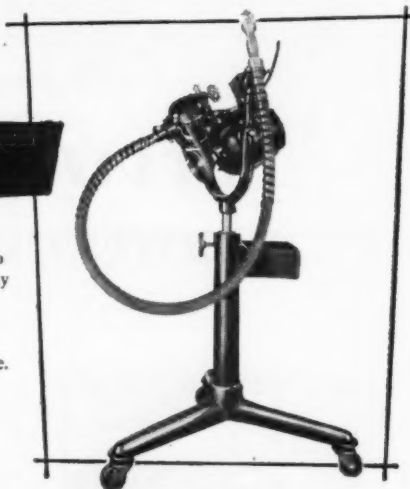


### FLOOR MOUNTING

The floor-mounted flexible shaft machine is one of the most popular. It can be moved from place to place. Amply powered, the standard is out of the way while the head is light and easy to work with.

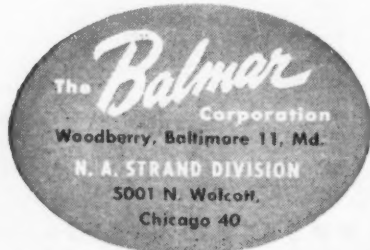
Model shown is three-speed mounted on swivel yoke adjustable floor type tripod.

Available in  $\frac{1}{2}$  H. P. to  $1\frac{1}{2}$  H. P. inclusive.



# STRAND

**FLEXIBLE SHAFTS and  
FLEXIBLE SHAFT MACHINES**



**SALES OFFICES: CHICAGO, BALTIMORE and TULSA**

**All Lufkin  
Chrome-Clad  
Micrometers  
now tapped on  
Warner & Swasey  
Tapping Machines**



*Warner & Swasey No. 11 Precision Tapping and Threading Machine in use at Lufkin Rule Company, Saginaw, Mich.*

**T**HE NAME, LUFKIN, has long been associated with extreme accuracy by users of precision measuring instruments. However, many man-hours of selective assembly were required to assure such accuracy in Lufkin Micrometers—until Warner & Swasey helped simplify and speed up their production.

Now Warner & Swasey No. 11 Precision Tapping and Threading Machines tap the high precision threads necessary in the hub and in the thimble of the micrometer. They perform each of these tapping operations in one pass, where three were previously required. And Warner & Swasey's positive lead screw principle maintains an accurate and constant lead control in these threads. No longer must an operator "feel" his way into the work by hand, or risk damage to the finished threads on withdrawal.

But of particular importance to Lufkin, operators can now qualify the starting positions of the taps so the "zero" mark on the micrometer's thimble matches perfectly with the reading lines on the hub when assembled. This drastically reduces the time-consuming selective and individual fitting of thimble to hub formerly necessary.

Where your work requires extreme threading accuracy on a production scale, call in your nearest Warner & Swasey Field Representative. He'll explain the many unique features of the No. 11 Precision Tapping and Threading Machine, and show you how it can improve your tapping operations.

**WARNER  
&  
SWASEY**  
*Cleveland*

**YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS, AND TAPPING MACHINES**

AVAILABLE NOW FROM MANHASSET, N.Y. AND LOS ANGELES

# 5 MORE REASONS FOR YOU TO SEE HIRSCHMANN'S U.S. STOCKS OF PRECISION MACHINE TOOLS

## HULLER PRECISION AUTOMATIC TAPPING AND THREADING MACHINES

UG 0

UG 1

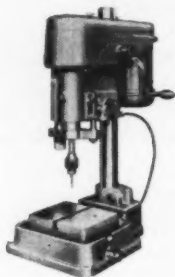
UG 2

UG 3

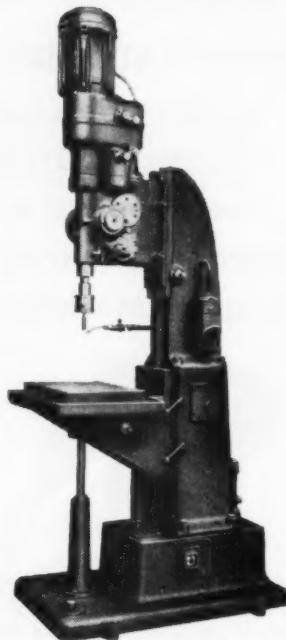
UG 5

### FOR MASS PRODUCTION

Operation Cycle Entirely Automatic  
Positive Electrical Control  
Exact Limitation of Feed Depth  
Wide Range of Speeds  
Cutting Capacity of High Speed Taps Fully Exploited  
Spindle Fed At Pitch of Thread Being Cut  
No Reversing Gears or Clutches  
Simple to Operate  
Very High Output



The Smallest: UG 0 For  $5/32''$  max. dia. Thread



The Largest: UG 5 For  $1\frac{1}{2}''$  max. dia. Thread

SEE THEM AT THE HIRSCHMANN SHOWROOMS • LITERATURE ON REQUEST  
Factory Service and Parts from Manhasset, N. Y. and Los Angeles, Calif.

CARL **HIRSCHMANN** CO.

affiliated with Hauser Machine Tool Corp.  
30 Park Avenue, Manhasset, N. Y.  
Western Branch: 5124 Pacific Blvd.,  
Los Angeles 58, Calif.  
Representatives in Principal Cities

EXCLUSIVE U.S. AGENTS FOR TORNOS WORKS, LTD.; SCHAUBLIN, S.A.;  
LAMBERT, S.A.; SAFAG, S.A.; and AGATHON, LTD.

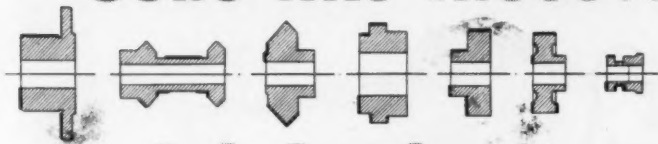
At 30 Park Avenue, Manhasset, N.Y., (and at Hirschmann's Western Branch: 5124 Pacific Blvd., Los Angeles) is the widest selection of Swiss precision machine tools available from any one address in the United States. Offered here by Carl Hirschmann Co. are Tornos Screw Machines, and Cam Making Machinery; Schaublin Lathes, Collets, Milling Machines and Drilling and Tapping Machines; Lambert Gear Generating Machines and Thread Cutting Machines; Safag Automatics for Wheel and Pinion Cutting, Form Cutter Milling and Cutter Backing Off; and Agathon Grinders and Die Sets. Offered by Hauser Machine Tool Corp. are Hauser Jig Boreers, Jig

Grinders, Optical Measuring Machines, Profile Projectors and Burnishing Machines.



**SWISS** PRECISION CRAFTSMANSHIP **SWISS** DEPENDABILITY ACCURACY

# Jobs like these...

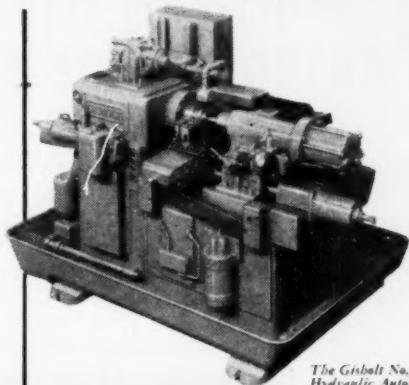


## on a Job-Lot basis...

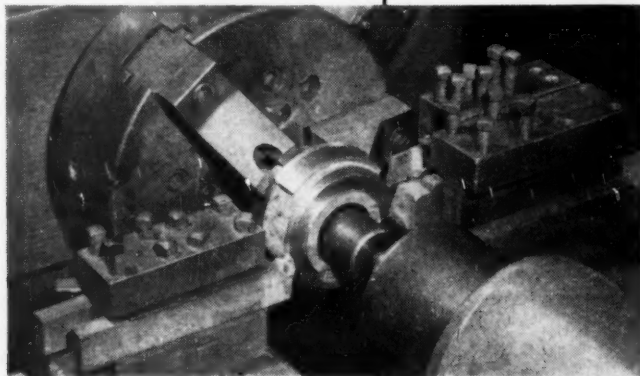
## on Automatic Lathes?

Absolutely! And these are only 8 of over 200 actual small-lot jobs handled on Gisholt No. 12 Hydraulic Automatic Lathes. The Crompton and Knowles Loom Works of Worcester, Mass., has four No. 12 Hydraulics busy producing and saving on work like this... and all with standard tool blocks! Job-lot work like this—and like yours—is a natural for the No. 12 Automatic. The cost is no more than a hand-operated lathe for work this size... yet you have the added advantages of automatic machining and one-man operation of two or more machines.

If you have contract work like this, now or pending, it will pay you well to get the facts on the No. 12 Hydraulic Automatic Lathe. There's a big 24-page catalog free for the asking.



*The Gisholt No. 12 Hydraulic Automatic Lathe gives you speed and accuracy plus easy set-up.*



**GISHOLT MACHINE COMPANY**  
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

**WHY  
NOT A**

## **MODERN GRINDING ROOM?**

**HERE'S REAL  
PRODUCTION EFFICIENCY!**

**SAVE TIME • SAVE ON WHEELS  
HANDLE THOSE ODD-SHAPED PIECES**

Here's the Standard Type HM Multi-speed Heavy Duty Snagging Grinder with its overhanging base (7½" extension from body of base). Overhanging base gives more room for grinding. You can reach those surfaces which are inaccessible for straight front base machines! Two operators can work conveniently!

Maximum wheel life. Single or multiple speeds. 3 H.P. to 7½ H.P. for 14" to 20" vitrified or high speed resinoid bond wheels. Multiple speed units have interlocking arrangement to prevent overspeeding of wheels.

**GET THE FACTS ON THIS IDEAL GRINDER TODAY!  
WRITE FOR CATALOG 44.**



**TYPE HM**

### **ALSO:**

**GRINDERS**  
All kinds!  
Up to 100 H.P.  
**BUFFERS**  
Polishers  
up to 60 H.P.  
**ABRASIVE  
BELT  
MACHINERY**  
**SPECIAL  
MACHINERY**  
**TWIN WHEEL  
TOOL  
GRINDERS**

**THE STANDARD ELECTRICAL TOOL CO.**

**2486 RIVER ROAD**

**CINCINNATI 4, OHIO**

the finish  
that starts a  
**Million  
Calls...**



*Bench mounted HS4 with felt bob on plastic mold polishing.*

**Your phone** will withstand the roughest use for more than a million calls. That record is due in part to a perfect molded surface free from pits and crevices where failures start. Haskins Flexible Shaft equipment polishes these precision molds to mirror-like perfection . . . assures constant, precise molding. Whatever your requirements for polishing, sanding, filing or grinding, you'll find the right Haskins machine and attachments with a proved record of fast, efficient performance. Your choice of mounting—bench, pedestal or suspended. Write today for full information. R. G. Haskins, 2645 W. Harrison St., Chicago 12, Ill.



Overhead



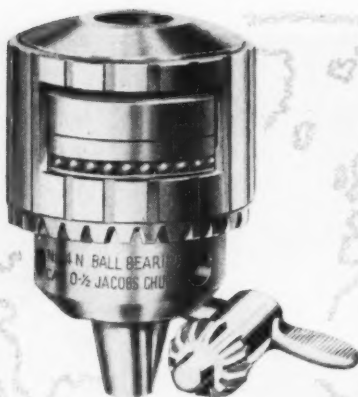
Bench  
mounted



Pedestal  
mounted

***haskins***  
FLEXIBLE SHAFT EQUIPMENT





There's never been another chuck like the Jacobs Ball Bearing Super Chuck for heavy duty drilling. Advanced engineering, precision craftsmanship and the use of special tough steel alloys combine to give it the firmest grip ever built into a drill chuck. It is preferred the world over for best results in drill press, lathe and hand screw machine drilling.



Made to the same close tolerances, the Jacobs Plain Bearing Chuck's precision ground construction provides a tightening action that maintains jaw parallelism for dead-center tooling. It is the world's most popular chuck for light- and medium-duty applications... For the complete line of Jacobs Chucks see your Industrial Distributor. The Jacobs Manufacturing Company, West Hartford 10, Connecticut.

*World's First Choice  
in Chucks*

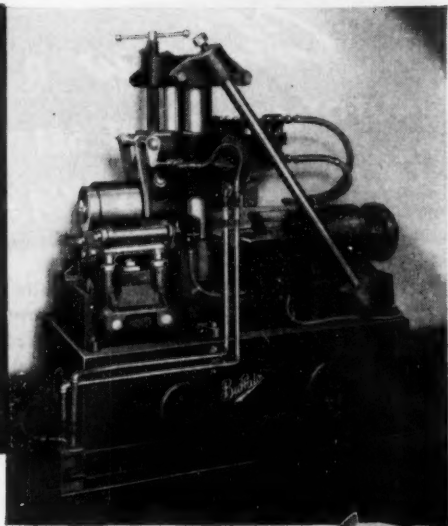
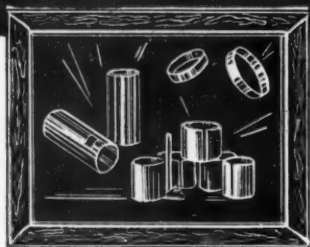
IF IT'S A

**JACOBS**

IT HOLDS

MACHINE and TOOL BLUE BOOK

**"PRODUCTION  
PICTURE"**



**— IF YOU MAKE  
COUPLINGS,  
METAL RINGS, CYLINDERS**

You can cold-roll rings or cylinders from  $\frac{1}{8}$ " to 2" thicknesses in a single pass, with one of the five standard sizes of "Buffalo" Wrapping Rolls! Here's production-line speed in forming commercially perfect circles. Foot pedal air release of work leaves operator's hands free and permits continuous operation of the machine. Proven in use, "Buffalo" Wrapping Rolls like the No. 1 model shown, are sure cost-cutters. FOR COMPLETE SPECIFICATIONS, WRITE FOR BULLETIN 3150-A.

**NEW  
HELPFUL  
HANDBOOK!**



80 pages of useful engineering facts on punching, shearing and bending with "Buffalo" Punches, Shears, Bar Cutters and Bending Rolls—shearing limitations of alloys—ultimate strength of materials, etc. Leatherette, wire-bound.

**"PUNCHING, SHEARING  
BENDING"**

Price \$3.00 postpaid  
in U.S.A.

**BUFFALO *Forge* COMPANY**

161 Mortimer Street

Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

**DRILLING   PUNCHING   CUTTING   SHEARING   BENDING**

# Chicago RIVET "912"

## AUTOMATIC RIVET SETTER

### CUTS COSTS 3 WAYS

#### 1 FASTENS FASTER . . .

Only the speed of the operator limits the 912's riveting speed. Completely automatic. A push on the foot pedal automatically feeds, inserts and clinches the rivet.

#### 2 DOES WORK OF SEVERAL MACHINES

Quick change rotary hopper and race-way makes the 912 adjustable in 5 to 10 minutes to set different size rivets. Adjustable anvil height and 12-inch throat provide further versatility.

#### 3 SAVES ON MAINTENANCE . . .

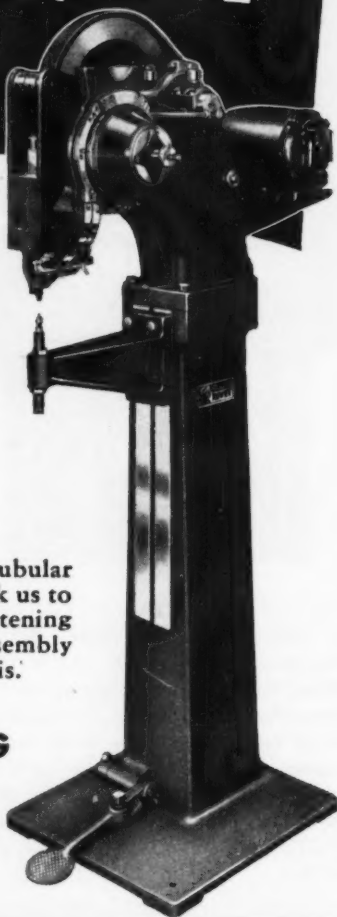
The 912 is massively built to stand the shocks of constant use and is designed for quick, easy servicing and parts replacement.

If your assembly calls for 3/16" steel tubular rivets or smaller, of 3/4" lengths or less, ask us to show you how the 912 can cut your fastening costs. Send a sample of your problem assembly (or blueprint) for a free fastening analysis.



#### FREE CATALOG

contains valuable engineering information and rivet specifications plus illustrated descriptions of 26 Chicago Automatic Rivet Setters.



## Chicago Rivet & MACHINE CO.

9610 West Jackson Boulevard, Bellwood (Chicago Suburb) Illinois  
Branch Factory: Tyrone, Pa.

•**ROTOR SCREW DRIVERS**

•**MAGNETIC BITS**

**"PAID OFF" IN ONE WEEK**

**T**HIS manufacturer of metal cabinets found a lot of time was being taken to insert and drive screws in locking bars with hand screw drivers. Some screws were loose, others so tight that bars buckled, others were difficult to reach.

The Rotor Application Engineer suggested Rotor Midget Screw Drivers that have double-cushioned clutch (for torque control) and magnetic bits (to hold screws in while inserting in the hard to reach places.)

Results? Over 40 man-hours saved per week. The labor savings *alone* "paid off" the tool costs in the unusual time of *one week*.

Want to study *your* methods for similar benefits?

Call in the Rotor Tool Application Engineer or write for Catalog #35.

**AIR O'TOOL**



**AIR**

**THE ROTOR TOOL CO.**

**CLEVELAND, OHIO**

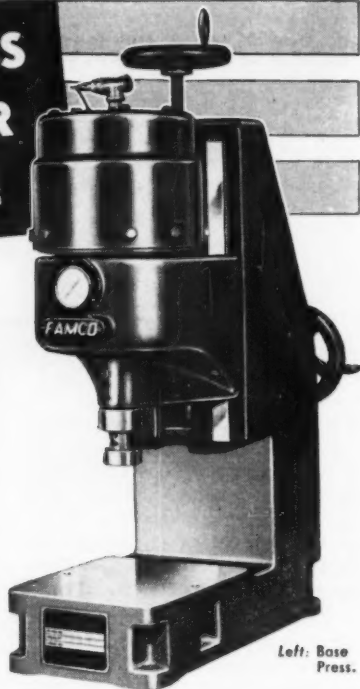
**HIGH  
CYCLE**

# NOW! AN AIR PRESS THAT'S BUILT FOR PRODUCTION USE

Here's another Famco Cost-Cutting Machine—a compact, rugged Air Press built for high-speed production operation. Famco Air Presses are available in 20 models,  $\frac{1}{2}$  to  $3\frac{1}{2}$ -Ton capacity with electric or air controls—the product of Famco and Bendix-Westinghouse engineering.

## SPECIAL FEATURES INCLUDE:

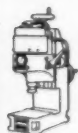
- Extra-long strokes infinitely variable from 0 to maximum.
- Semi-steel cast frame and cylinder mount; use of alloy-steel, copper tubing and steel fittings throughout.
- Frictionless (leak-proof), longer-lived cylinder requires no lubrication.
- Accurate, built-in pressure gauge.



Left: Base Press.

- Ram keyed to prevent rotating.
- Infinitely variable vertical adjustment of cylinder.

## OTHER MODELS AVAILABLE WITH CHOICE OF CONTROLS



Left: Single Air Control Type.



Right: Dual Air Control Type.



Left: Single Electronic Control Type.



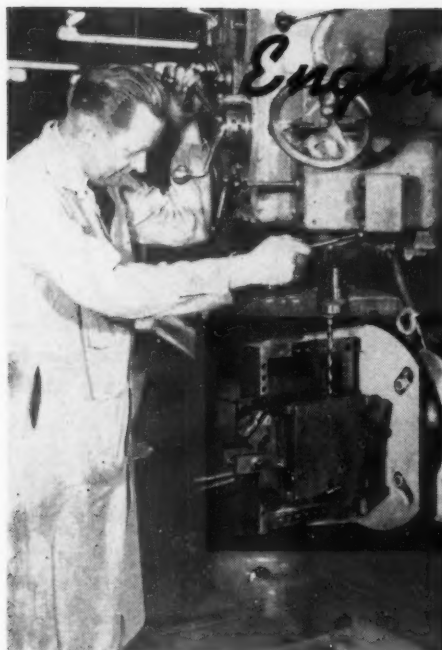
Right: Dual Electronic Control Type.

For further details on the line, write for new Famco Air Press Catalog.

**FAMCO MACHINE COMPANY • 1320 18th ST. • RACINE, WIS.**

**famco** COST  
CUTTING **machines**

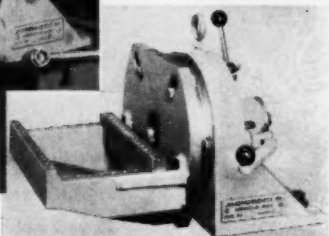
**ARBOR PRESSES • DRILL PRESSES • BAND SAWS • AIR PRESSES  
POWER PRESSES • FOOT PRESSES • SQUARING SHEARS**



# *Engineered for* **PRODUCTION!**

**Adaptable to all types of  
UPRIGHT and RADIAL DRILLS**

TABLE **J&B** TYPE  
INDEXING TRUNNION



- Simplifies jig construction
- Increases jig life by less handling
- Reduces set-up time
- Speeds up production
- Minimizes operator fatigue
- Large pieces handled with more ease than with box jig alone
- Jig rotation removes chips
- Eliminates abuse to machine table
- Positive dowel pin indexing by 15° increments from 0° to 360° by graduated dial
- Roller bearing heat treated spindle
- High carbon steel face plate with 90° T slots
- Compact rigid construction plus built in accuracy

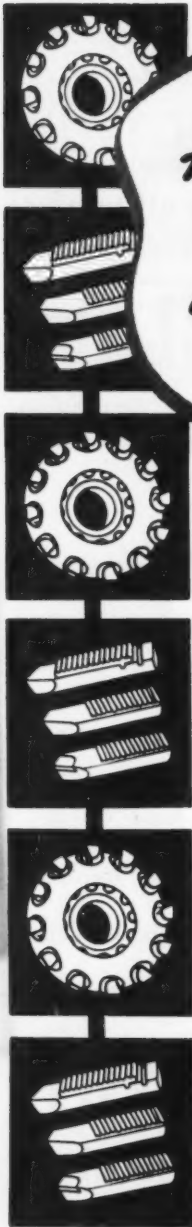
Production Tools by . . .

## **JOHNSON & BASSETT**

INCORPORATED

**WORCESTER • MASSACHUSETTS**

*Since 1870*



*All Lovejoy Blades for  
Type "A" Milling Cutters  
are interchangeable from  
4½" to 24" in diameter*

... and this applies to  
every "A" cutter ever made!

Lovejoy Type "A" face milling cutter blades offer unsurpassed economy — 1) they are interchangeable throughout the complete range of housing sizes, 2) H.S.S., carbide and cast alloy blades are interchangeable in every housing, 3) every blade will fit every Type "A", even if you have housings 30 years old, 4) only a minimum of stock must be removed when sharpening, 5) a large percentage of every blade is usable; 6) there is no need to carry a large inventory, as Lovejoy can supply blades promptly from stock. For superior performance, plus maximum economy, use Lovejoy Type "A" for every face milling job.

Write for free catalog!

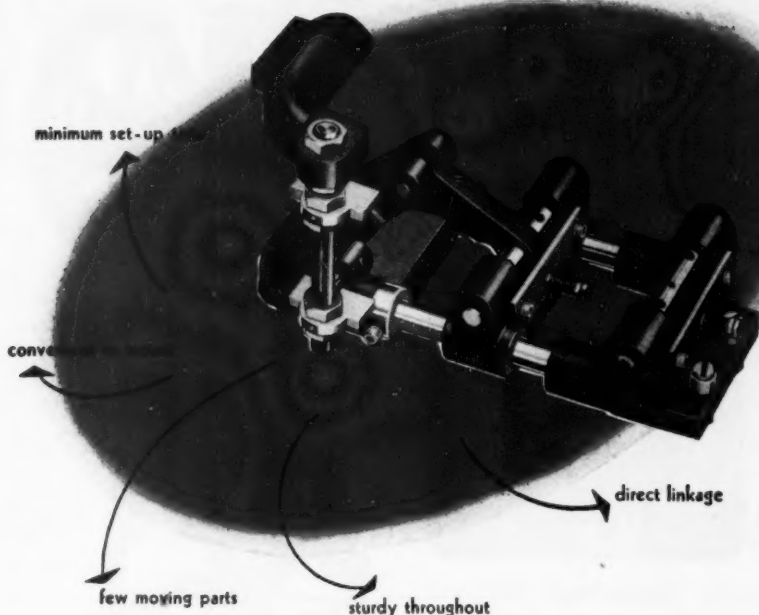


136 MAIN ST., SPRINGFIELD, VERMONT

**LOVEJOY**  
**TOOL COMPANY, INC.**

## new automatic **SUREFEED**

improves press performance



After experimenting with a variety of automatic press feed designs, Producto now presents the new, field tested, Surefeed. Set-up time has been cut, feed maintenance troubles minimized because of simpler design and fewer moving parts.

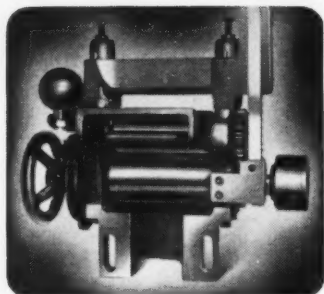
Producto Surefeed is quickly and easily mounted on the die set ... both can be handled as a single unit. Set-up and adjustment is very simple. It has no actuating springs, cams or other intricate parts ... linkage is direct and positive. A high degree of accuracy is inherent in this direct feed ... but pilots or other positioning devices may be used when exact stock register is essential.

Write today for Surefeed bulletin. See how the Surefeed can improve your press department schedules.

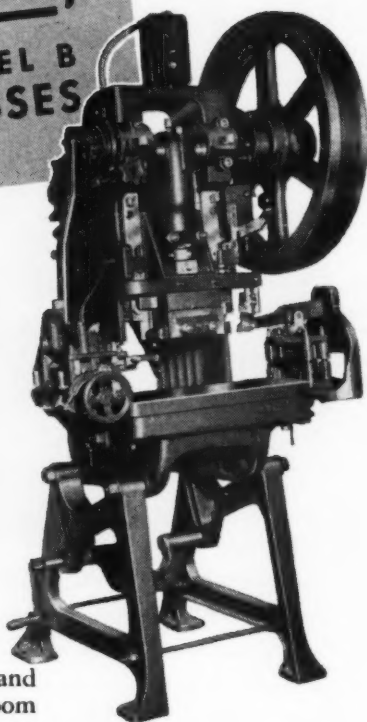
## **THE PRODUCTO MACHINE CO.**

960 HOUSATONIC AVENUE • • BRIDGEPORT 1, CONNECTICUT

*More Press Capacity*  
**PERKINS MODEL B  
INCLINABLE PRESSES**



Single Feed Roll



Round out your press capacity and boost the efficiency of your press room with these efficient, versatile presses.

Protect your press operators and increase production with the use of Perkins Feed Rolls.

This No. 351 Model B Inclinable Press with 20 ton capacity, has single feed roll and adjustment for stock line, accurate over-running clutch and top roll lift. Will feed stock 6" wide to a length of 0" to 8". Write for bulletin.

PRESSES BUILT TO SPECIAL SPECIFICATIONS



**PERKINS MACHINE CO.  
WARREN, MASSACHUSETTS**

# New STA-SHARP Diamond Tools

## Save Time and Dollars!



Enlarged view shows STA-SHARP Diamond Tool. Phantom view above shows overlapping layers of selected small SOLID diamonds which are firmly locked in place in a special matrix by exclusive bonding process.

PATENT APPLIED FOR

**70 DIAMONDS  
PER SQUARE INCH!**

STA-SHARP tools are NOT cluster diamond tools. They are made with many overlapping layers of fine quality, natural small diamonds. The cutting face of each STA-SHARP presents not less than 70 solid diamonds per square inch.

## Cut your Diamond Costs by 50%

The diamonds in these new type dressing tools do not get dull. With the exclusive STA-SHARP design, as the top layer of diamonds wears down, the next overlapping layer comes into cutting position. The diamonds always do a good trueing and dressing job. That's why STA-SHARP tools require no turning, no periodic inspection, no supervision — which means a saving of valuable operator and machine time.

STA-SHARP tools are practically fool-proof. They are difficult to abuse—even through carelessness or incorrect use by inexperienced operators. STA-SHARP tools are not reset—they stay sharp to the very end. That's why they eliminate fading, dress wheels faster, make possible better finishes and produce more pieces between dressings.

### Golconda Corporation

(Division of Super-Cut, Inc.)

**3420 North Knox Avenue  
Chicago 41, Illinois**

Leading companies who have switched to STA-SHARP for their Centerless grinders report savings up to 50% on their diamond costs!

### Send for Circular

Mail coupon for special circular giving full details and prices on STA-SHARP Diamond Tools — also Catalog of complete line of Golconda Diamond Tools for every purpose.



**GOLCONDA CORPORATION**  
(A Division of Super-Cut, Inc.)  
**3420 North Knox Ave.**  
**Chicago 41, Illinois**

Gentlemen: Please send me special circular of STA-SHARP diamond tools and complete catalog of Golconda Diamond tools.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Firm Name \_\_\_\_\_

**INCREASES  
PRODUCTION...**

**LOWERS COSTS...**

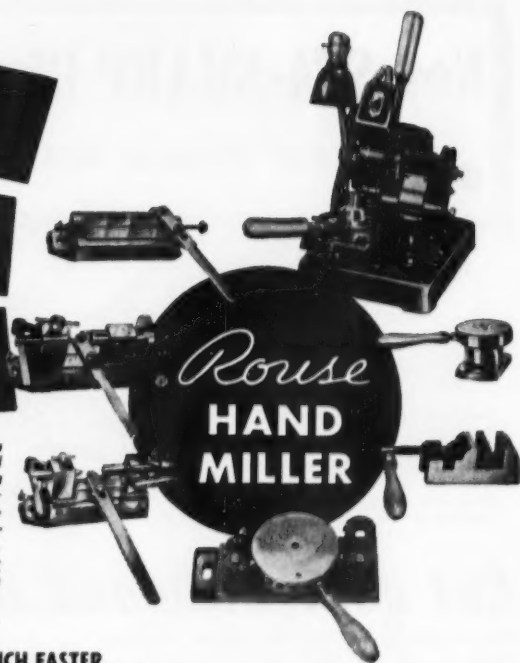
**PAYS FOR ITSELF  
QUICKLY...**

The ROUSE HAND MILLER is a widely used, inexpensive, high speed, ball bearing, motor driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials—fast, accurately, and at very low cost. Only \$98.00\*.

Fixtures (illustrated) extra.

Motor equipment:— $\frac{1}{4}$  H.P. 110 Volt AC 60 cycle, single phase, swivel motor mount and light—\$25.00\*

\*All prices FOB Chicago.

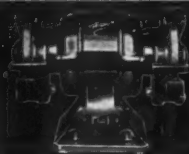


- ★ **MILLS SMALL PARTS MUCH FASTER.**
- ★ **DRASTICALLY CUTS YOUR INVESTMENT IN EQUIPMENT.** Replaces expensive production machinery—or releases it for other jobs.
- ★ **INEXPERIENCED HELP CAN OPERATE IT.** Safe, simple, fool-proof operation.
- ★ **NO MORE COSTLY SET-UP TIME.** \$98.00\* price so low that it pays to keep one or more Hand Millers always set-up for special operations.
- ★ **YOU GET A BETTER PRODUCT**—the result of ABSOLUTE ACCURACY.
- ★ **A LOSS BECOMES A PROFIT** when marginal pieces are finished on the Hand Miller instead of on high cost equipment.
- ★ **VERY LOW MAINTENANCE.**
- ★ **USED REGULARLY IN 1163 MANUFACTURING PLANTS** (some of which use as many as 30 machines)—yet on the market a scant few years.
- ★ **UNIQUE—VERSATILE.** Nothing else like it. One or several machines can be the answer to some of your production problems.

**Write today  
for further  
information.**

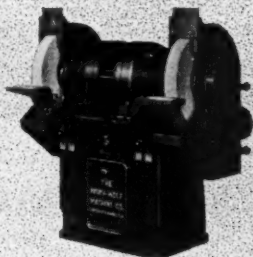
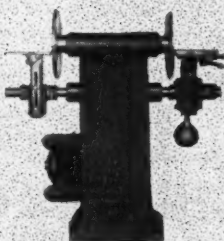
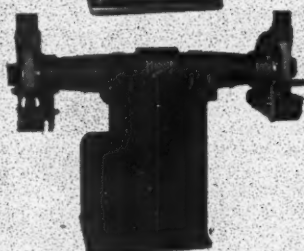
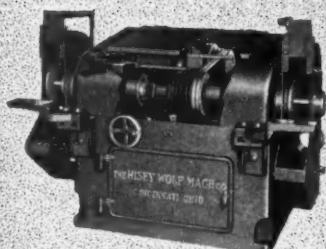
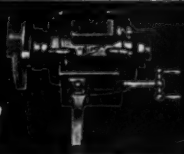
**H. B. ROUSE & COMPANY**

2214 N. WAYNE AVE., CHICAGO 14  
50 YEARS OF SERVICE TO INDUSTRY



# GRINDERS?

## *Sure! All Kinds*



Wet Grinders and Dry Grinders  
Drill Grinders and Disc Grinders  
Grinders with extra wide  
wheel spacing

Bench Grinders and Pedestal Grinders  
Lathe Grinders and Center Grinders  
Grinders for snagging or tools  
Large Grinders and Small Grinders  
High Speed or Low Speed  
Grinders for Production or tool room.

HISEY Catalog No. 71-BL lists more  
than 200 different types and sizes of  
Grinders from  $\frac{1}{4}$  to 25 H.P. capacity.

**Write for it now.**

Also a complete line of Buffing and  
Polishing Machines in direct drive  
and V-Belt drive models.

**Hisey** THE HISEY-WOLF MACHINE CO.  
CINCINNATI 8, OHIO  
Division of The Cincinnati Electrical Tool Co.

**CUT  
COSTS**

**BY CUTTING**

*faster*  
**With STONE**

*High Speed*  
**CUT-OFF MACHINES**

**Production cutting of ferrous and non-ferrous metals at the rate of 4 seconds per square inch.**

Powerful and ruggedly built, flexible and easily operated, Stone High Speed Cut-Off machines are ready to give you all the advantages of fast, clean, low-cost abrasive cutting. The geared-in-head motor on each model is engineered without the use of belts, an exclusive Stone feature permitting delivery of maximum constant power. Result: Increased cutting speed affords greatest efficiency and insures longer wheel life.

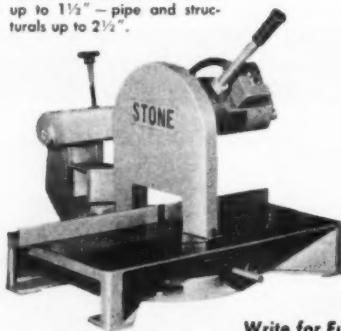
### **STONE Swing-Cut M14**

32" x 34" bench model

- Full 3½ h.p. geared-in-head motor engineered with positive drive
- Cutting head swivels up to 45° in either direction for angle cutting.

#### **CAPACITY**

Ferrous and non-ferrous solids up to 1½" — pipe and structurals up to 2½".



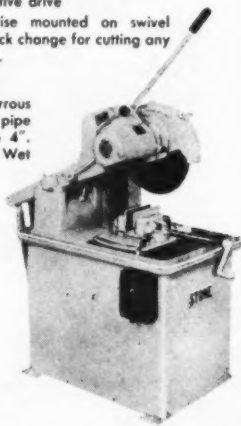
### **STONE Swing-Cut M16**

Floor Model — Min. space required: 2½' x 4'

- Full 5 h.p. geared-in-head motor engineered with positive drive
- Self-centering vise mounted on swivel plate permits quick change for cutting any angle up to 45°.

#### **CAPACITY**

Ferrous and non-ferrous solids up to 2½" — pipe and structurals up to 4". Can be equipped for Wet Cutting.



*Write for Further Information*

**STONE MACHINERY CO., INC.**

302 Fayette St.

Manlius, N. Y.

# SAVE UP TO 50%

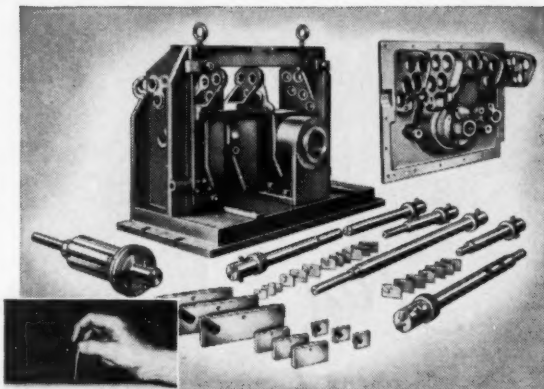
## in over-all boring time

### Davis Block-Type Cutters Eliminate Trial Cuts and Extra Adjustments

There's no time wasted taking trial cuts and resetting cutters several times to get a bore size. Operators can quickly duplicate at the machine accurate settings established in the tool room.

What's more, using Davis block-type cutters — you can bore different sizes, face, chamfer and counter-bore one or more holes on the same axis in a single operation! If you want to change tools — simply slip out one block — slip in another — quick and easy like changing a razor blade.

*Especially on turret lathes*—Davis Multiple-Cutters save time! One Davis multiple cutter completes boring, counter-boring, reaming, chamfering and similar cuts in a simple indexing of the turret.



Typical example of Davis "Complete Tooling Service" — showing finished part with its fixture, standard Davis designed block-type tools and boring bars for rough and finished boring, counter boring and facing.

Tapered centering hole and taper lock screw brings the cutter to positive position immediately upon assembly in bar.

### Davis "Complete Tooling Service"

**Increases production... lowers cost... gives you greater flexibility of equipment**

Davis "Complete Tooling Service"—backed by a world-wide sales and service organization — offers you a full line of standard boring tools (capacity — any diameter from  $\frac{1}{8}$ " to 54")... plus design and construction of special tools to meet your particular requirements.

Davis maintains a large staff of design engineers and field servicemen to aid you in every phase of efficient tool selection.

Now you can standardize your whole shop on one complete line of modern tools... count on one dependable source of supply and engineering help... share in the very latest developments in tool design. You can realize all the advantages of the Davis "Complete Tooling Service"... increased production, lower costs and greater flexibility of your equipment.

### Check This Full Line...

**Send For Catalogs**

1. Block-type boring tools.
2. Micrometer-type boring tools.
3. Micrometer adjustable block-type boring tools.
4. Fly-cutter-type boring tools, SUPER micrometer.
5. Stub boring sets, SUPER micrometer.
6. Boring heads (standard or special).
7. Planer tools.
8. Vertical boring and turning mill tools.
9. Quick-change arbors, sleeves and spindles.
10. Line boring bars (standard or special).

**DESIGNED FOR EVERY  
BORING AND REAMING  
REQUIREMENT**



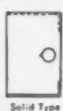
Regular Type



Single Cutter  
Micrometer Type



Multiple  
Cutter Type



Solid Type  
Block Cutter



## DAVIS BORING TOOL

Division of GIDDINGS & LEWIS MACHINE TOOL COMPANY

Fond du Lac, Wisconsin

World's Largest Builder of Horizontal Boring, Drilling and Milling Machines • Planer-Type Milling Machines • Large Vertical Boring Mills

December, 1951

# *Specify* ATLANTIC

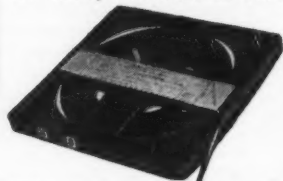
## BAND SAW BLADES

*For  
Smoother*



## CONTOUR CUTTING

**A**TLANTIC SAWS meet all of your requirements for a superior blade on complicated die and fixture radius cutting. ATLANTIC specializes in accurate milled and precision set teeth, hardened to exact temper.



Atlantic's strong, practical box, plainly marked on sides and top. Remains in good condition until entire coil is used.

ATLANTIC'S special alloy steel insures longer wear and easier welding.

ATLANTIC'S one temper saw for all metals reduces stock you have to carry. Cut to length and welded, ready for use. Packed in strong Atlantic box. Write for new Atlantic Catalog.

### *Atlantic Saw Mfg. Co.*

INCORPORATED

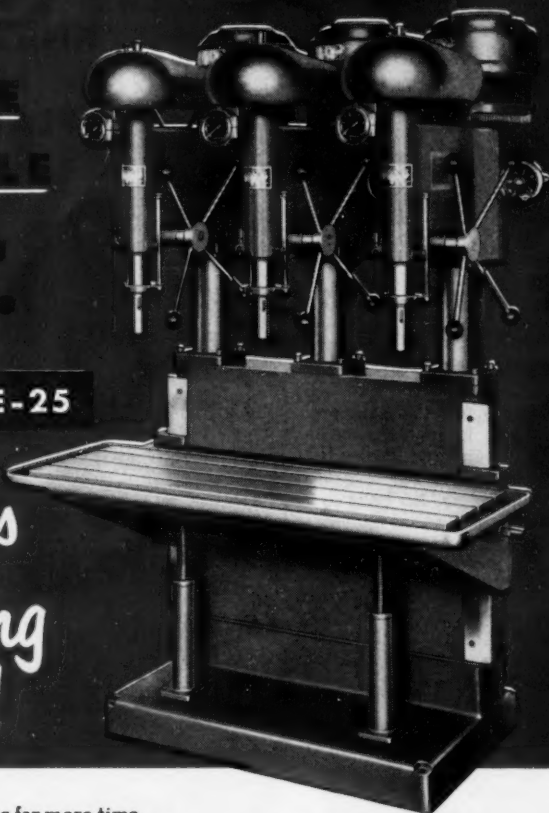
Exclusively Manufacturers of Band Saw Blades

153 Brewery St., New Haven, Conn.

new  
**THREE**  
**SPINDLE**  
drilling  
machine

**SIBLEY ME-25**

*Slashes  
handling  
time!*



Work-handling consumes far more time than work-cutting in producing many jobs. To reduce manual effort by one-half increases production far more than by faster cutting speeds. To make this improvement without burdening the operator—in fact to make it easier for him—is the chief advantage of

the new Sibley Model ME-25.

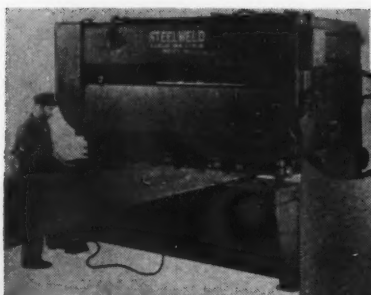
The variable speed drive, the big 25" swing, the extra large table, the convenient speed controls, the handy tachometers, all combine to make this 1" capacity, medium weight machine a production advantage in any shop!

**SIBLEY**

MACHINE & FOUNDRY CORP.  
79 EAST TUTT STREET  
SOUTH BEND 23, INDIANA

**SIBLEY MACHINE & FOUNDRY CORP.**  
79 E. Tutt St., South Bend 23, Indiana  
Send Catalog No. 70.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_



## THE *Right* KNIFE CLEARANCE FOR EVERY PLATE THICKNESS

### ONLY STEELWELD SHEARS HAVE THIS SIMPLE KNIFE ADJUSTMENT

It is simple, fast and easy to adjust the knife clearance on a Steelweld Pivoted-Blade Shear to suit every plate thickness. No bolts to loosen! No bed to move! No feeler gauges required!

Only turn a crank and watch a dial. That's all there is to it. The large easily-read dial indicates the clearance between knives in thousandths of an inch and also shows the plate thickness that may be cut with any knife setting. Because of the ease with which knife adjustments are made, every cut made on Steelweld Shears is the best cut possible—straight, smooth, accurate. And of importance, knives remain sharper for longer periods.

Steelweld Shears are built for thicknesses of 12 gauge to 1½ inch and for lengths of 6 to 16 feet.



#### GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.  
5211 EAST 282nd STREET • WICKLIFFE, OHIO

# STEELWELD PIVOTED BLADE SHEARS

## DRILLING POINTERS.....by Red Shield



**ABRASION.**  $\frac{1}{16}$ " taper shank drills on cast iron valve job were wearing due to abrasion. Changed surface heat treatment to suit their problem. Drill life increased beyond all expectations.

**STAINLESS.** Regular drills averaged 3 holes per grind in tough work-hardening stainless steel. We suggested No. 506 F Fast Spiral Drill with special heat treatment and point. ...Now get more than 90 holes per grind.



**SERVICE.** 70 years' experience behind our Red Shield Service Staff...to help solve your metal cutting problems. Get in touch with your local Standard Tool Co. distributor.

# STANDARD TOOL CO.

DEPT. 1-G, 3930 CHESTER AVENUE  
CLEVELAND 14, OHIO



New York • Detroit • Chicago • San Francisco

THE STANDARD LINE: Drills • Reamers • Taps • Dies • Milling Cutters • End Mills • Nibs • Counterbores • Special Tools

# Why **A·B·C** Bushings

## Last *as much as 10%* Longer

Since the inception of this business, we have used only steel containing chromium and/or tungsten • That's why A·B·C Bushings deliver as much as 10% longer service than the average • When a supplier decides to "up" the quality of his steel, it may be a couple of years before his customers get the benefit of the change, their orders in the meantime being filled from stock or blanks antedating the improvement • With A·B·C Bushings, steel of chromium and/or tungsten content is no recent innovation. They've *always* been made from this superior grade steel • That's why it is always good business to specify A·B·C.



### **A·B·C DRILL JIG BUSHINGS**

HEADLESS PRESS FIT • SLIP RENEWABLE • FIXED RENEWABLE • HEAD PRESS FIT  
Also Headless Liners, Locating Jigs, Lockscrews, Clamps



**Unexcelled for Accuracy  
and Concentricity**

Write for catalog, price list and other information needed by the tool engineer.

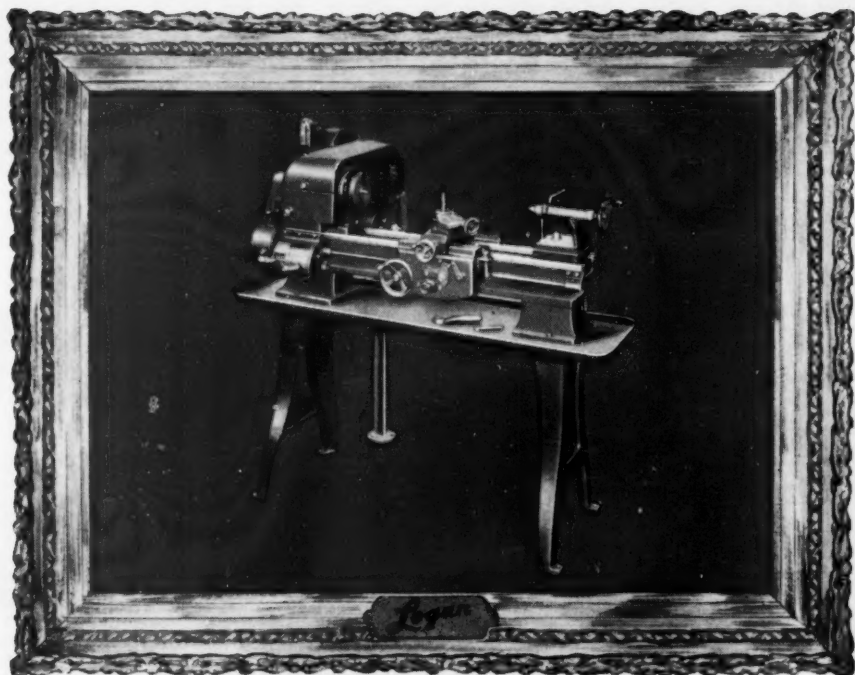
**ACCURATE BUSHING COMPANY**

437 NORTH AVENUE, GARWOOD, N. J. • Westfield 2-6400



### DISTRIBUTORS

BOSTON, MASS. W. A. Siebert Co.	BUFFALO, N. Y. W. S. Gallagher Co.	CHICAGO, ILL. H. J. Weber & Co.	CLEVELAND, OHIO Die Supply Company	DALLAS, TEXAS The Stanco Co.	DAYTON, OHIO Geo. D. Laughter Co.
DAVENPORT, IOWA Davenport Engineering Corp.	HOUSTON, TEXAS Chickering Tool & Equip't Co.	DENVER, COLO. Iver. J. Esbensen Co.	DETROIT, MICH.	MINNEAPOLIS, MINN. Chas. W. Stone Co.	NEW YORK, N. Y. Carl Eberhard
INDIANAPOLIS, IND. The Standard Die Supply, Inc.	MILWAUKEE, WISC. The Stone Company, Inc.	PHILADELPHIA, PA. Albert H. Dorn	RHINEBECK, N. Y. Frank A. Hart	SOUTH BEND, IND. Fermite Tool Co.	STRATFORD, CONN. Ellsworth Steel & Supply Co.
ROCHESTER, N. Y. Tool & Die Supply D. J. Andrews, Inc.					



## THE PICTURE OF VERSATILITY

# A *Logan* LATHE

## Accurate in Every Lathe Operation

With Logan Lathes you are ready for every type of lathe operation. Heavy cuts, tool room precision jobs, high speed production runs and large volume second operation work are all routine Logan assignments. Versatility is inherent in the Logan ball bearing spindle with its wide speed range and sustained accuracy; in the accurate, rugged overall construction of Logan Lathes; and in the full line of Logan Lathe attachments. 11" swing, 1" collet capacity and  $1\frac{3}{8}$ " spindle hole are typical of the speci-

fications which make these accurate Logans capable of handling a high percentage of any shop's lathe turning. Easy to set up, simple to operate, frugal with power and durable, Logan Lathes economize every way you use them. In fact, no other lathe of comparable specifications can match the Logan in economy.

WRITE FOR THE  
LOGAN LATHE AND  
SHAPER CATALOG

LOOK TO LOGAN FOR BETTER LATHES AND SHAPERS

### LOGAN ENGINEERING CO.

4901 West Lawrence Avenue, Chicago 30, Illinois

Logan 920  
Quick Change Gear Screw Cutting  
Lathe 11" Swing, 1" Collet  
Capacity,  $1\frac{3}{8}$ " Spindle Hole 24"  
and 36" Between Centers



# FORESIGHTED

against



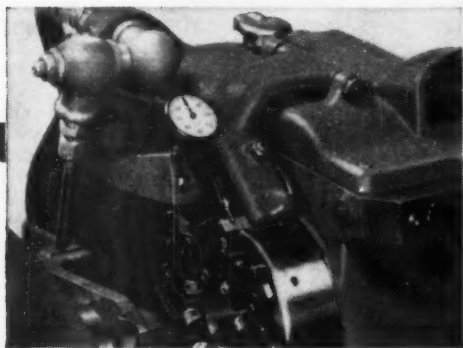
Constant-speed drive shaft insures uniformly rapid automatic movements. Change gears provide production rates from 3 to 364 seconds for one piece per cycle. 16 spindle speeds from 10,000 to 910 r.p.m. Takes stock to  $\frac{1}{4}$ " dia. and turns up to  $2\frac{7}{8}$ " length.



***Brown & Sharpe***

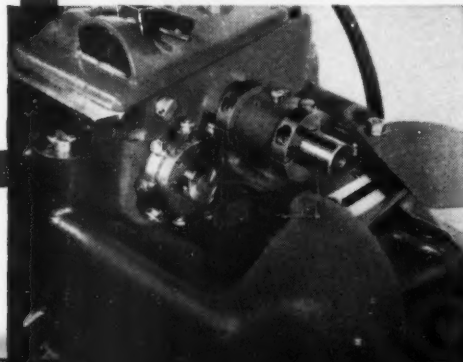
# PROTECTION

## Skilled-Operator Shortage...



**Tool Adjusting Dial Indicator** on swing-arm affords quick, accurate replacement of tool . . . saves time and cut-and-try spoilage.

**Individual Micrometer Stops** for each tool simplify accurate duplication of parts without machining cams to extremely close accuracy.



### **Brown & Sharpe Automatic Pinion Turning Machine**

equips you for high output,  
without expert  
pinion turning specialists!

With defense orders now adding to normal demands for staff and pinion work, the Brown & Sharpe Automatic Pinion Turning Machine represents one of the soundest investments many manufacturers can make.

This modern automatic single-point turning machine dependably meets all close-tolerances and fine-finish requirements of military and civilian assemblies such as clocks, instruments, fuses and timers. What's more, accurate operation with exceptionally high uniformity can be maintained without highly skilled operators.

Write for detailed specifications.  
**Brown & Sharpe Mfg. Co.,  
Providence 1, R. I., U. S. A.**

**IT WILL PAY YOU TO COMPARE WIEDEMANN WITH ANY OTHER METHOD!**

**COMPARE PRODUCTION TIMES!**

TIME FOR FIRST PIECE, INCLUDING SET-UP  
10 TO 15 MIN.

TIME FOR EACH ADDITIONAL PIECE  
3 TO 5 MIN.

TIME FOR FIRST PIECE, INCLUDING SET-UP  
8 TO 10 MIN.

TIME FOR EACH ADDITIONAL PIECE  
2 TO 3 MIN.

**COMPARE TOOLING**

- 20 different tools ready for instantaneous use.
- Replace any tool in 20 seconds.
- Inexpensive punches, dies, and holders.
- No special adaptors needed for tools up to 3 1/4" dia.
- Standard and special tools—louvers, knockouts, extrusions, etc.
- Positive stripping action—no spring strippers.

**COMPARE WORK LOCATING**

- "In and out" locations against rugged gauge bar (handwheel controlled).
- Dial shows "in and out" position in 1/4".
- Rigid heavy duty drop latch stops locate work for all size punches.
- Drop latch stops set directly to graduations on gauge bar.
- Handles work up to 120" long (60" long locate from one corner).
- Roller top work supporting table.



28 inch throat

**WIEDEMANN | TURRET PUNCH PRESSES**

WIEDEMANN MACHINE COMPANY  
4265 Wissahickon Ave.  
Philadelphia 32, Pa.



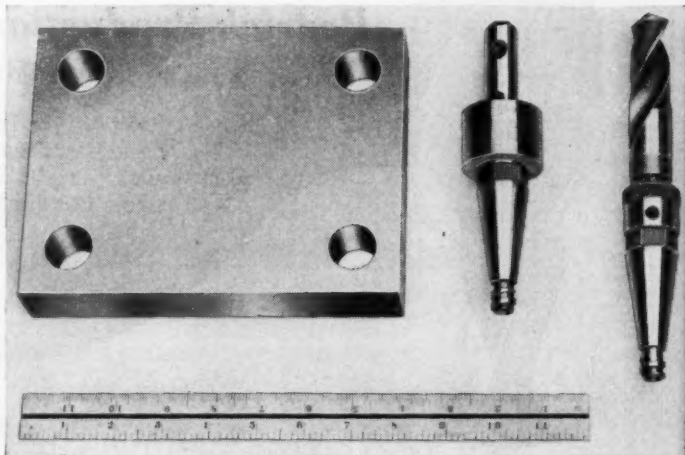
# Hole Location Practices

*Published in the interests of greater accuracy and quality in the toolroom and on the production line by the Moore Special Tool Company, Inc. 728 Union Avenue, Bridgeport 7, Conn., builders of Jig Bore, Jig Grinders, Panto-Crush Wheel Dressers, Die Flippers, Motorized Centers and a complete line of Hole Location Accessories.*

## 4 HOLES to $\pm .0002''$ in 8 MINUTES

### How would you do it?

Sixteen of these pieces were needed. The four 1" holes are  $1\frac{1}{8}''$  deep—with location and size tolerance  $\pm .0002''$ . It would be impossible to obtain such accuracy using a drill jig—and impractical on this short run. Then how could you locate, drill, bore and check the four holes in only 8 minutes?



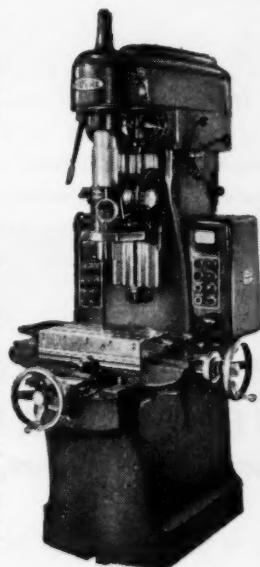
### HERE'S HOW:

Using a No. 2 Moore Jig Borer with one  $\frac{3}{16}''$  drill and one cut carbide bit, all sixteen pieces (64 holes) were finished in 2 hours and 38 minutes!

### FIVE SIMPLE STEPS:

1. Load piece (no fixture needed)..... 30 sec.
  2. Locate and drill 4 holes with  $\frac{3}{16}''$  drill at 800 RPM..... 240 sec.
  3. Bore holes with carbide bit at 1600 RPM..... 120 sec.
  4. Check last hole and reset bit for next piece..... 60 sec.
  5. Unload ..... 30 sec.
- Total time per piece..... 480 sec. or 8 min.  
Total for 16 pieces (including 30 min. set-up time)..... 2 hrs. 38. min.

Why make a costly drill jig for those short production runs—or worry about keeping work within close tolerances? The Moore Jig Borer is a necessity in the toolroom; let it help you on tough production jobs, too.



Only tools used on this Jig Borer production job were drill and carbide bit shown.



Have You Bought Your Copy?

Over 7,500 copies of "Precision Hole Location" have been sold to date. Available at special price of \$3 in U.S.A.; \$3.50 outside U.S.A. 448 pages, over 400 illustrations, 184 pages of Woodworth Coordinate Location Tables from 3 to 100 holes. Send check or money order to Moore Special Tool Co., Inc., Bridgeport 7, Conn.



## IS THIS THE SHAPE YOU WANT?

*It's yours with a  
Pedrick Production Bender*

Rely on Pedrick Production Benders to solve your pipe, tube, strip shapes and bar stock bending problems.

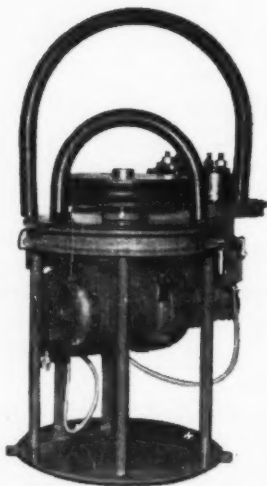
Pedrick's perform accurately — uniformly — speedily — economically.

Equipped with relay controls for semi-automatic duplicate bending, Pedrick's will bend pipe up to 6" extra heavy — has no clamps — thereby eliminating many expensive tools. Pedrick's require no previous experience, special skills, expert supervision. They are inexpensive — keep your costs low. If speed, accuracy, quantity, with quality, is your aim, write for descriptive folder.

**PEDRICK TOOL AND  
MACHINE COMPANY**

3638 N. LAWRENCE ST.

DEPT. 3

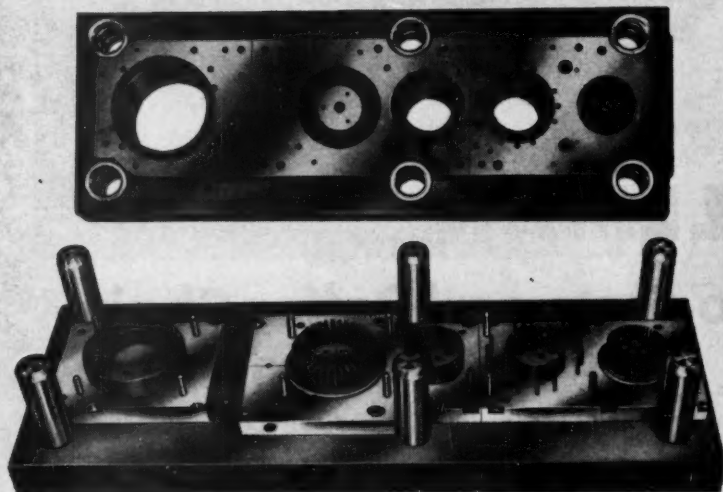


PHILADELPHIA 40, PA.

# HARIG PRECISION

# CARBIDE DIES

Cut Production Costs



EXHAUSTION  
DIE  
BLANKING  
DIE  
DRAW  
DIE  
PROGRESSIVE  
DIE  
JCS or  
FIXTURE  
MOLDING  
DIE



Proven - Longer Die Life

Proven - Less Down Time

Proven - Greater  
Production

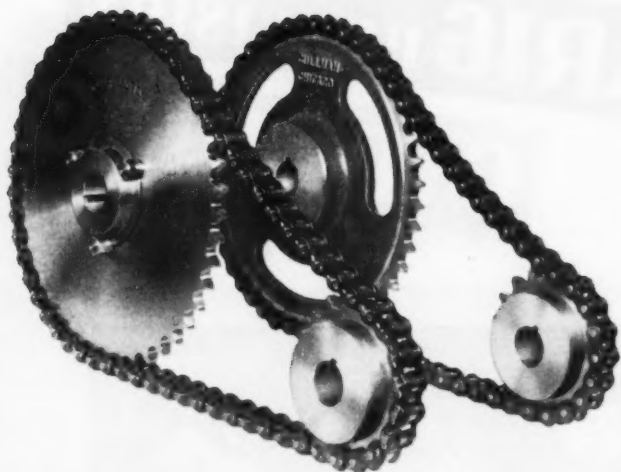
Proven - Lower Cost  
Per Piece

## HARIG

MANUFACTURING CORPORATION

323 NORTH ALBANY AVE., CHICAGO 12, ILL.

Your Inquiries Invited.



# **CULLMAN**

## **Sprockets and Roller Chain**

### **STOCK OR SPECIALS**

Utilize Cullman Sprockets and Roller Chains supplied promptly from Cullman's adequate stocks. Cullman Wheel Co. has been supplying high efficiency drives of low first cost and long service life throughout its 56 years of specialization in designing and manufacturing dependable transmission units and components. These factors are the common objective of machine designers and purchasers. Orders for specials are delivered quickly.

Send us your prints and  
we will quote promptly.

• • •

Many Cullman Distributors  
ready to serve you.

**CULLMAN WHEEL COMPANY.**  
1350 West Altgeld St.  
Chicago 14, Illinois

# **CULLMAN**

*power transmission*

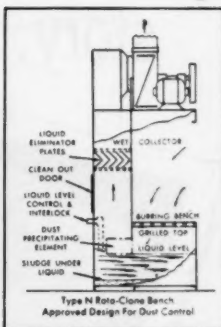
## **SPROCKETS and ROLLER CHAIN**

**today's best buy is better air!**



**Type N Roto-Clone  
Bench for Magnesium  
Finishing Operations.**

**Dictaphone Corporation,  
Bridgeport, Connecticut**



## **SAFELY EQUIPPED** for light metal finishing

### **AAF ROTO-CLONE Type N Bench Removes Hazard Of Magnesium Dust at Dictaphone Corp.**

The Type N ROTO-CLONE\* dynamic precipitator has a remarkable safety record in efficient collection and safe storage of dangerous dust. Developed by AAF engineers for magnesium finishing, this unit or bench type wet-collector has no moving parts, pumps or nozzles, yet maintains the highest efficiency in collecting extreme fines. The Type N ROTO-CLONE immediately removes incendiary dust from the source by passing entrained material through a sinuous water curtain under heavy turbulence . . . induced by the flow of air through a stationary im-

pellor. Dust is stored at once in sludge form within the base of the self-contained unit, and under water for complete safety.

The eleven sizes and three arrangements of Type N meet requirements for all dangerous finishing operations, such as stand grinding, burring, buffing, sawing, etc. Unit design also provides additional safety factors by allowing isolation of operations.

If incendiary dust is one of your problems, call your nearby AAF representative or write for Engineering Bulletin No. 277 A.

\*ROTO-CLONE, is the trade-mark (Reg. U.S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydrostatic precipitator types.



**American Air Filter**  
COMPANY, INC.

312 Central Ave., Louisville 8, Ky. • In Canada: Darling Bros., Ltd., Montreal, P. Q.

December, 1951

3 pictures  
tell the  
story...



## **JIFFY PADDED SHIPPING BAGS**

**JIFFY SHIPPING BAGS** are used extensively to ship precision parts and instruments, highly finished or machined parts, accessories, hand and machine tools and similar items.

Three pictures—the 3 basic steps for speedy packing, tell the entire story of the **JIFFY PADDED SHIPPING BAG** for profitable, dependable and speedy shipping.

### **STEP 1 INSERT**

Simply insert into the bag the item to be shipped. No boxes to set up—no fuss—no bother.

### **STEP 2 CLOSE**

Fold over top of bag. Staple or use gummed tape. No strings, fancy closures or special "know-how" needed.

### **STEP 3 TAG**

Affix label and postage. Package is now ready for shipment.

**JIFFY PADDED SHIPPING BAGS** are made from strong moisture-resistant kraft with built-in "expansion" cushioning, which protects shipment from moisture, abrasion, dirt and damage during transit.

**JIFFY PADDED SHIPPING BAGS** are perfect for packing orders in advance, for expected orders and samples. They are ideal for C.O.D. shipments.

Available in 7 standard sizes

**FREE**  
SAMPLES ON REQUEST



**JIFFY** manufacturing company  
360 FLORENCE AVENUE • HILLSIDE, N. J.

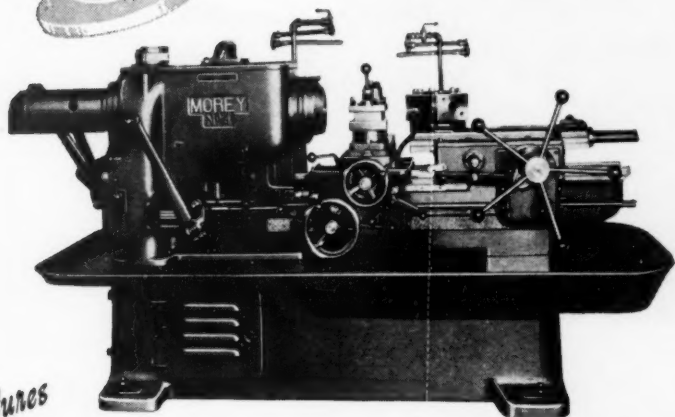


# MOREY

## TURRET LATHES

No. 2 Plain Type

Nos. 3, 4 and 5 Universal Type



### Features

Infinite variable vibrationless spindle speeds.

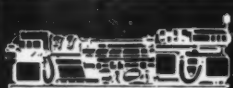
Remote speed selection control for speed and ease of operation.

The newly designed MOREY TURRET LATHES take advantage of tungsten carbide tools and incorporate all technical improvements in metals, electronics and hydraulics...our design is not hampered by tradition.

Size	Bar Capacity	Swing	Motor
No. 2 Plain.....	1" x 6"	14"	3 HP
No. 3 Universal....	1 1/2" x 10"	16 1/2"	5 HP
No. 4 Universal....	2" x 12"	19 1/2"	7 1/2 HP
No. 5 Universal....	2 1/2" x 14"	21 1/2"	15 HP

#### FOR BAR and CHUCKING WORK

OBTAIN MAXIMUM PRODUCTION WITH MINIMUM EFFORT FROM MOREY TURRET LATHES . . . INVESTIGATE!



# MOREY

## MACHINERY CO. INC.

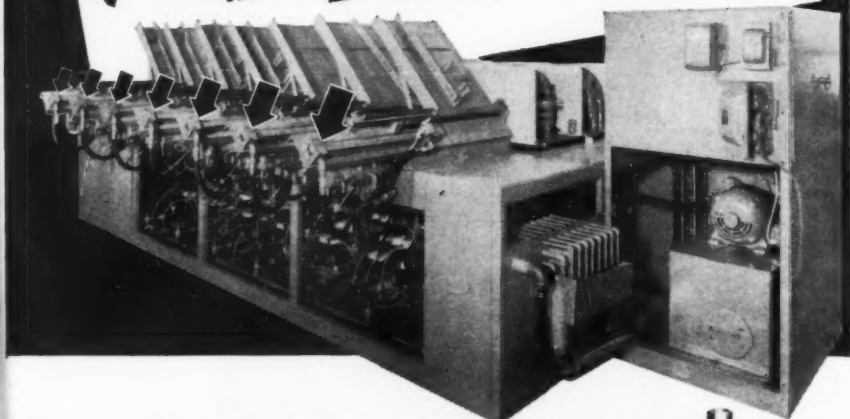
406 BROOME ST., NEW YORK 13, N.Y.

Cable Address: WOODWORK, N.Y.

Telephone: CAnal 6-7400

Job File No. 3259

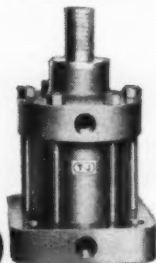
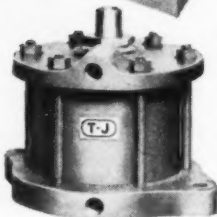
# Feeds Automatically with T-J CYLINDERS



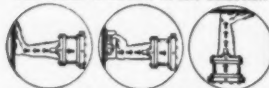
T-J Hydraulic Cylinders furnish efficient, automatic "push power" for feeding devices in this new Ajax-Northrup induction forge heating equipment.

This unit—manufactured by Ajax Electrothermic Corp., Trenton, N. J.—automatically heats steel forging stock in sizes ranging from 1 to 4 inches (rounds or squares) at 2250°F. at rate of 7500 to 8500 lbs. per hour. Has space for 8 heating stations . . . each with hydraulically operated billet feeding devices employing T-J Cylinders. These cylinders also eject heated bars automatically. Induction heating with this equipment results in uniformity of successive billets fed to the forge—thus controlling quality of finished forgings and reducing rejects.

Do you have a tough job in power movement—pushing, pulling or lifting? Let T-J help you *simplify machines, save labor and cut costs* by using T-J Air or Hydraulic Cylinders! Many standard sizes and styles . . . cushioned or non-cushioned . . . 100 lb. or 50,000 lb. Precision-built, long life. Write for more information. The Tomkins-Johnson Co., Jackson, Mich.



FOR POWER MOVEMENT IN ANY DIRECTION



100 LB. or 50,000 LB.

35 YEARS EXPERIENCE

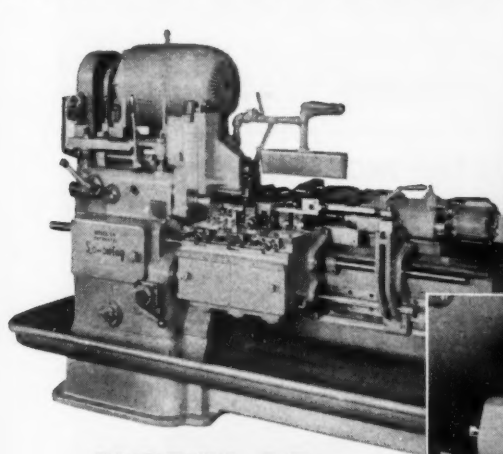
**TOMKINS-JOHNSON**

PNEUMATIC, AIR AND HYDRAULIC CYLINDERS, CUTTERS, CLAMPERS

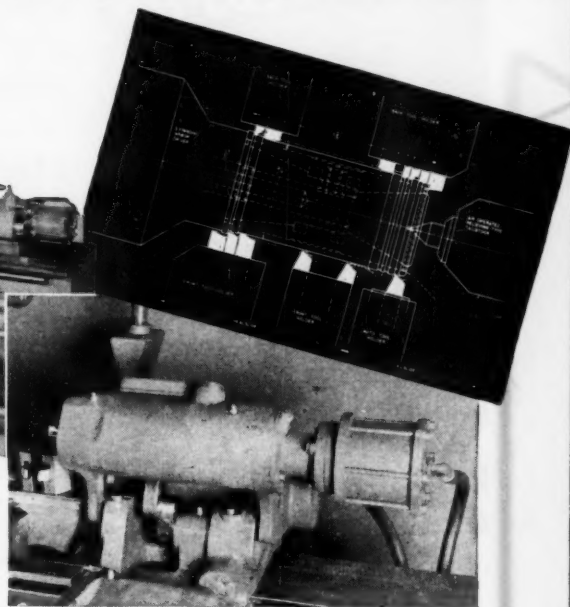


# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



## MODEL LR Lo-swing LATHE SPEEDS PRODUCTION ON CYLINDER LINERS



**Problem:** To automatically turn outside diameters, face and groove cast iron Cylinder Liners of various types with Carbide Tools.

**Solution:** Model LR Lo-swing Automatic Lathe was selected for this job because of its demonstrated fine performance with carbide tools, and its ease of setting-up due to its Simplified Change-Over Mechanism. A Relieving Tailstock which minimizes tailstock spindle overhang, and which facilitates loading and unloading, was incorporated.

The cast iron cylinder liners are delivered to the Lathe with the bore machined to size and the large end faced. They are held and driven with an air-operated, expanding collet arbor which extends the full length of the piece. This large area

driving surface permits the high cutting speeds and coarse carriage feeds required for fast production. Loading of the parts is simplified with the Relieving Type Tailstock, shown in the close-up illustration. Since the driving arbor is bolted to the spindle nose, the operator is relieved of handling heavy stub arbors generally used when work is held between centers. The outside diameters and the short taper on the tailstock end of the liners are turned with six tools mounted on the front slides; all facing and grooving operations are accomplished with tools mounted on the rear slide. The entire operation is automatic—the operator simply loads and unloads the parts and pushes the starting button.

Seneca Falls engineers are at your disposal to assist you with your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

## PRODUCTION COSTS ARE LOWER WITH Lo-swing

# SPEEDY AIR VISE

**SPEEDS UP**

✓ MILLING

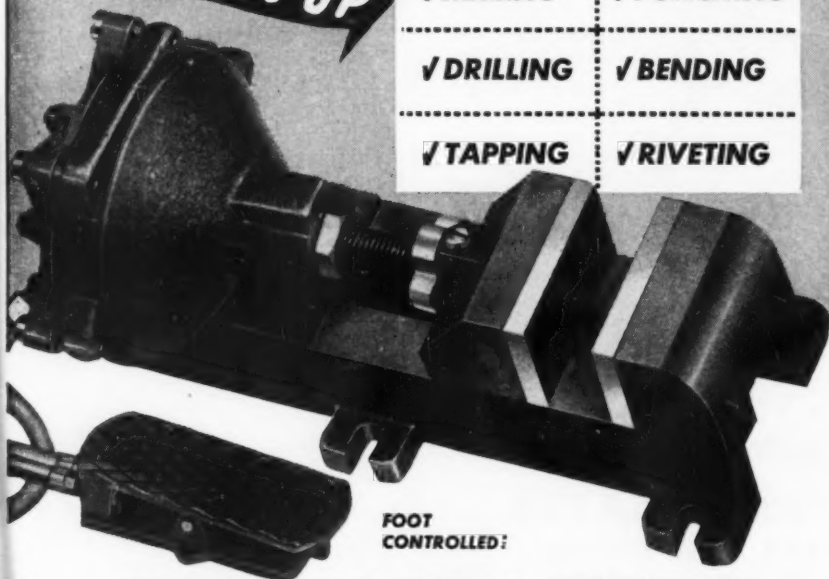
✓ PUNCHING

✓ DRILLING

✓ BENDING

✓ TAPPING

✓ RIVETING



**FOOT  
CONTROLLED**

## GRIPPING FORCE 15 TIMES AIR LINE PRESSURE

Speedy Air Vise helps you do dozens of operations faster, better, cheaper—by air pressure! Foot control valve opens and shuts vise instantly, leaving *both* hands free to produce *more*! Jaw opens up to 3 inches, holds castings, parts, jigs, etc. Compact, trouble-free, inexpensive.

Complete with Foot Control Valve, Air Hose and Fittings . . . only **\$29.90**

ORDER FROM YOUR MILL SUPPLY DEALER OR WRITE DIRECT



### AIR REGULATOR

Precision-built. Delivers pressures up to 140 lbs. With gauge, \$4.95  
Less gauge, \$2.95



### AIR FILTER

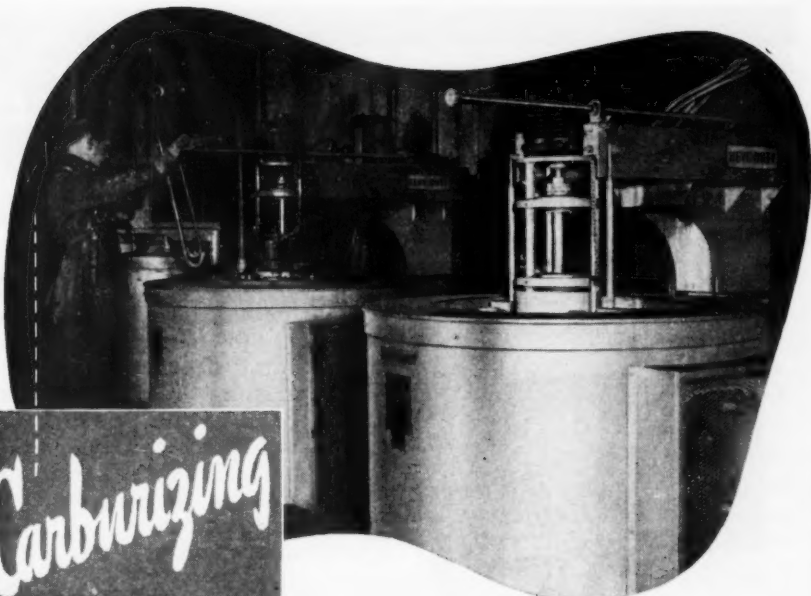
Keeps water and particles out of the regulator and pneumatic tools. \$2.45

### BLOW-GUN

Looks and operates like a gun. Ideal for cleaning and blowing out chips, dust, filings, scraps, etc. . . \$3.00



W. R. BROWN CORP. • 2651 N. NORMANDY AVE. • CHICAGO 35, ILL.



**Carburizing**

**dense loads  
at WESTERN  
AUTOMATIC  
with  
HEVI DUTY  
CARBURIZERS**

The Western Automatic Machine Screw Company, Elyria, Ohio, uses two Hevi Duty HD-1848 Vertical Retort Furnaces.

● Two Hevi Duty Vertical Retort Furnaces are used at Western Automatic Machine Screw Company to carburize exceptionally dense loads of screw machine products such as rollers, bolts and pins. Consistent uniform results on these dense loads are assured by multiple zone control of heating elements and rapid circulation of the carburizing atmosphere.

This all purpose furnace may also be used for Nitriding, Dry Cyaniding, Bright Annealing and Clean Hardening. Its rugged construction and easy accessibility of moving parts result in a very economical maintenance cost.

Send for complete details on this all purpose furnace — Ask for Bulletin HD-646.

## **HEVI DUTY ELECTRIC COMPANY**

HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

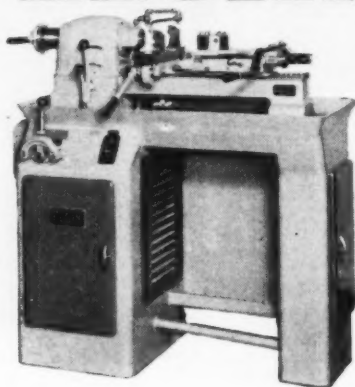
**MILWAUKEE 1, WISCONSIN**

ON SMALL DIAMETER

# ELGIN

*Precision Parts*

WILL MACHINE THEM . . . .

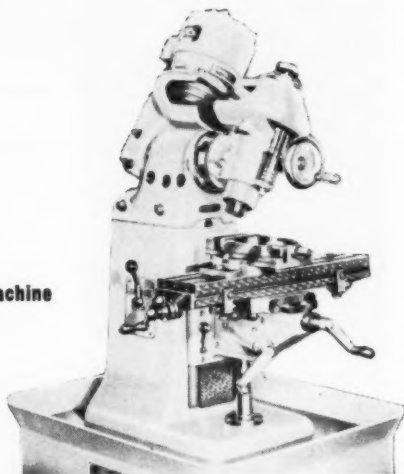


#### **Elgin Knee Hole Type Hand Screw Machine**

Variable speed range, 120 to 3800 rpm. 9" swing. 1" collet capacity. Collet rack inside of motor compartment door. Independent coolant system (5 gal.) mounted in rear, outside — cleaner, more accessible.

#### **Elgin Vertical Bench Milling Machine**

Preloaded ball bearing spindle.  $\frac{9}{16}$ " collet capacity. Five speeds ranging from 400 to 4000 rpm. Vertical travel of spindle,  $1\frac{3}{4}$ ". Table  $4\frac{1}{2}$ " x 18". 90° swivel each side of center line.



# ELGIN TOOL WORKS

1772 BERTEAU AT RAVENSWOOD AVE. — CHICAGO, 13 ILL.

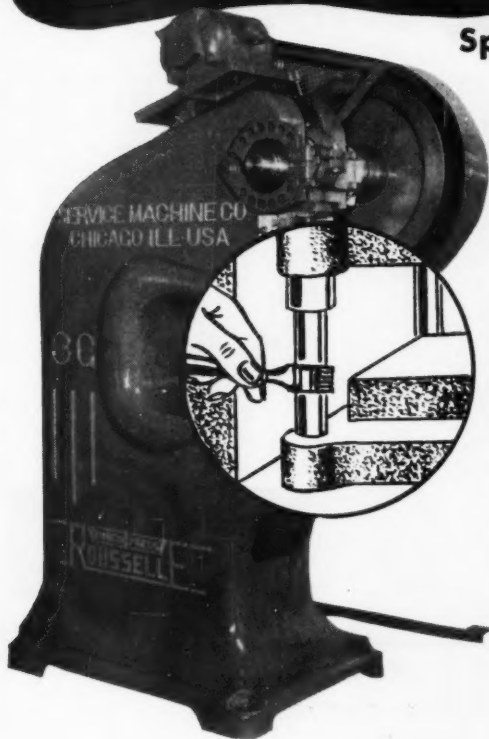
*Insist on*  
**COMPLETE PROTECTION**  
 for Pins and Bushings!

Specify **CMD**

*Anti-Scoring*  
**LUBRICANTS**

These Concentrated lubricants have no equal for use on guide posts and bushings of die sets because they give *Complete* protection for a long period of time. Check their many outstanding advantages.

1. They outlast ordinary lubricants three to one.
2. They prevent any metal to metal contact.
3. They increase die life.
4. No scoring or seizure.
5. Will not drip off.
6. Will not corrode.



Write for **FREE** sample kit of one tube each of CMD Center Point Lube and CMD Center Point Oil. Address Department 12-BB.



**Chicago Manufacturing & Distributing Co.**  
 1928 West 46th Street Chicago 9, Illinois



**"SLASH" YOUR SET-UP TIME**

WITH THE

**TREE**

**TAPER BORING TOOL**

Cut expensive set-up time from hours to a few minutes with the revolutionary TREE taper boring tool. You can use it on your present milling machine, jig borer or boring bar. Write today for complete information. In addition to boring taper holes this tool can be used for—



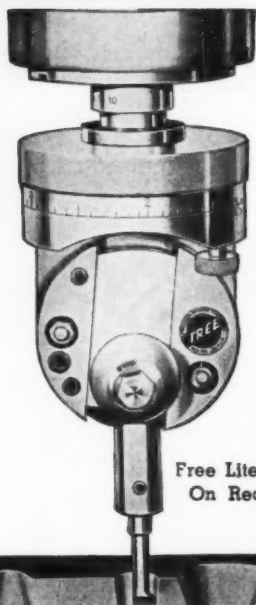
- Straight boring . . . as shown at left used as offset boring tool.



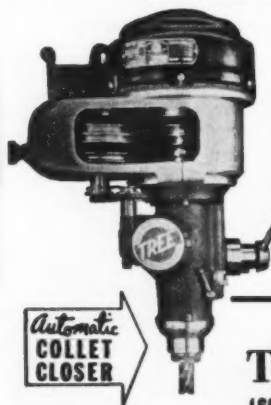
- Facing . . . up to 10" in diameter.



- Outside Turning . . . either straight or tapered up to 8" with extension bar.



Free Literature  
On Request



Automatic  
COLLET  
CLOSER

## **TREE** UNIVERSAL MILLING HEAD ATTACHMENT . . .

All Angle Milling, Drilling & Boring.  
Compact Design.  $\frac{3}{4}$ " Collet Capacity.  
4" Quill Travel. Power Feed Eight Speeds—  
140-3500 RPM or 210-5200 R.P.M. Hardened  
& Ground Spindle & Quill. Enclosed  
Micrometer. Depth Stop.

For Full Information — Write Dept. B

## **TREE** TOOL and DIE WORKS

1600 Junction Ave.  
Racine, Wisconsin

Export Address:  
STATES TRADING CO.,  
401 BROADWAY,  
NEW YORK 13, N.Y.  
Cable Address: "STRADES01" N.Y.

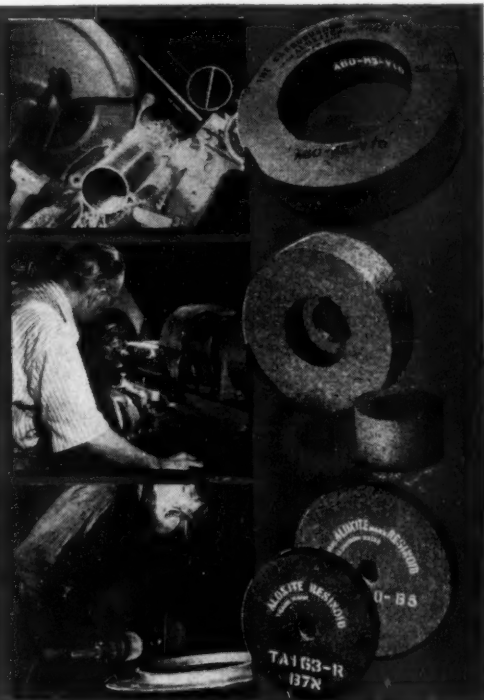
# The RIGHT Abrasive gets the job done BETTER

You can be sure of using the right abrasive in every case by selection from the *complete* CARBORUNDUM line...the only complete line of abrasives manufactured under one brand name. For utmost economy in metalworking, you'll find it pays to standardize on abrasives from the *complete* CARBORUNDUM line.

● Improved V10 Bond Centerless Grinding Wheels by CARBORUNDUM are engineered to maintain grinding efficiency with minimum contact pressure. Their cool free cutting action makes them ideal for heavy stock removal on both hard and soft materials.

● Excellent form holding qualities, less wheel dressing and fewer machine adjustments during a run are outstanding features of Internal Grinding Wheels by CARBORUNDUM. Effectively applied to wide range of work; low inventory requirements.

● Bonded products by CARBORUNDUM for general purpose and weld grinding expedite a high rate of production at lowest cost. Typical example is the Type 1 Portable Grinding Wheel with *built-in* rubber bushing, which reduces wheel "bounce"...lessens operator fatigue.



See Your **CARBORUNDUM** distributor...or write Dept. BB 81-25.

## Only **CARBORUNDUM**

TRADE MARK

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, N. Y.

*makes ALL Abrasive Products  
...to give you the proper ONE*

# VERTICAL QUILL TRAVEL MILL ATTACHMENT



**\$245<sup>00</sup>**

COMPLETE  
WITH MOTOR  
FOB Chicago

High speed, medium and light  
operation made for  
Bench, Floor and Pedestal Mills.

*New!*

PRECISION MADE BY

**RUSNOK**

ONLY LOW COST

QUILL TRAVEL ATTACHMENT

**MILLING**

**DRILLING BORING**

- Quill travel 1½"
- Five spindle speeds  
380, 700, 1200, 2500, 5200 RPM
- Micrometer depth stop
- Positive Quill lock
- Forward, stop, reverse control

- Angular settings, single  
and compound
- Full use of table travel
- Time-saving settings
- Quick, easy speed change
- Light, efficient rigid

WRITE TO

TOOL

4840 W. North Ave.

**RUSNOK**

FOR BULLETIN C

WORKS

Chicago 39, Illinois

# ADAMAS

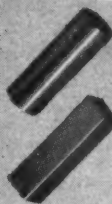
**...now has a complete range  
of solid carbide inserts  
in stock for you!**

ADAMAS rounds out its line and brings you GOOD NEWS ON FAST DELIVERY for all of your finish ground solid carbide insert blanks and centerless ground solid cylinders, in a complete range of styles and sizes. Your orders will be shipped IMMEDIATELY from our large and adequate stocks, they're available in all of the standard grades for these styles of blanks.

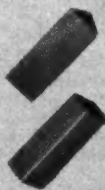
Our new Stokes S-5—a high production press of the largest type in use in the carbide industry—ASSURES YOU of the USUAL PROMPT ADAMAS SERVICE in SC, TB, SQ, and RB style blanks.

Smart carbide users always

*Specify* **ADAMAS TUNGSTEN CARBIDE** for the triple advantages of quality, delivery and price



Style SC Solid Round Inserts for Boring Tools, Insert Type Tools, and wear parts



Style TB Triangulars for Insert Type Tools

Style RB Rectangular for Insert Type Tools, all finish ground.

Style SQ Squares for Insert Type Tools

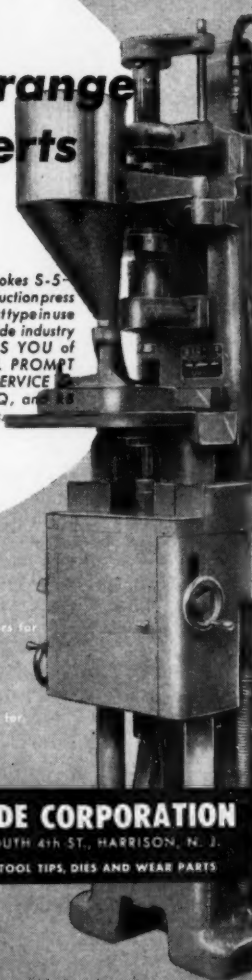
Send today for the NEW ADAMAS CATALOG #AB51 the latest "AID to CARBIDE USERS"



**ADAMAS CARBIDE CORPORATION**

1000 SOUTH 4TH ST., HARRISON, N. J.

PRODUCERS OF TUNGSTEN CARBIDE TOOL TIPS, DIES AND WEAR PARTS





***"I believe every  
company should..."***

**MR. CLARENCE FRANCIS**  
Chairman of the Board  
General Foods Corporation

**"I believe every company should conduct a person to person canvass right now, for the best way to promote the sale of U. S. Savings Bonds is to put an application card into each employee's hand and allow him to reach his own decision."**

As one of America's top executive salesmen, Mr. Clarence Francis knows that you sell more when you "ask the man to buy." Naturally, that means a person to person canvass of *all* your employees, but it is not as difficult as it may sound. In fact, it is very simple:

Tell your employees personally—or over your signature—why the Payroll Savings Plan is good for them and their country . . . designate your Number One Man to conduct the canvass . . . enlist the aid of employee or-

ganizations . . . distribute the posters, leaflets and other promotional material furnished by the Treasury Department . . . *be sure that every man and woman on the payroll is given a U. S. Savings Bond application form.*

Join the thousands of companies, large and small, which are now conducting person to person canvasses. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. Get in touch with him.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the G. M. Basford Company and



**MACHINE and TOOL BLUE BOOK**  
**222 E. WILLOW AVENUE**  
**WHEATON, ILL.**

**SIX SPINDLE  
PRE-SELECTIVE SPINDLE SPEEDS  
TURRET TYPE AUTOMATIC INDEXING  
DRILLING AND TAPPING MACHINE**

*... gives you*

**6 MACHINES  
IN ONE**

**THE NEW No. 2 MODEL A**

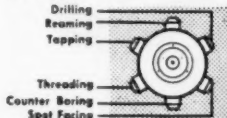
**Burgmaster**

*Designed for ...*  
**HIGHER PRODUCTION WITH GREATER  
ACCURACY AT LOWER COST  
PER PIECE MACHINED**

The No. 2 Model A BURGMASER will definitely cut your second operation costs because: Loss of time due to movements of parts from one spindle to another are eliminated; Close tolerances on size and concentricity are easily maintained; Set-up is simple and fast—unskilled operators can run the machine; Less floor space and power required; Rigidity, power and spindle speeds permit the use of high cutting speeds; Fixture costs can be reduced—fixtures can be materially simplified; All this means more parts per hour—per man, at less cost to you.

- ★ ¾" Drill Capacity
- ★ ½" Tap Capacity
- ★ 1 to 2 H.P., 2 speed, 3 phase, 60 cycle Motor
- ★ 12 Spindle Speeds, ranging from 225-3000 R.P.M.
- ★ 4 Speeds, pre-selective per spindle, at any one setting
- ★ 8" Ram Feed
- ★ 19" Table Travel
- ★ Throat Depth—11-5/16"
- ★ Spindles Mounted on Class "O" Timken Bearings

- ★ Power Index, utilizing Geneva Mechanism
- ★ Individual Depth Stops
- ★ Completely Enclosed Gear Box
- ★ Table work surface—17"x33"
- ★ Approximate weight—1500 lbs.
- ★ Floor space required—36"x36"
- ★ Extremely close tolerance can be held



Write today for  
detailed information.

**BURG TOOL MANUFACTURING CO. DEPT. BB12**

**3743 DURANGO AVENUE • LOS ANGELES 34, CALIFORNIA**

1943

Again the time has come  
to ask your company,  
and every company, to

1951  
*Get in the*

**SCRAP**

**F**OR every ton of ingot steel produced, at least a half-ton of iron and steel scrap must have *previously* reached the furnaces. Steel is currently being produced at full capacity, more than 100 million ingot tons annually—and there is a developing scrap shortage of serious proportions. Just as in the early years of World War II, the steel industry asks the help of *all* industry to relieve the situation.

## **TWO IMPORTANT THINGS TO DO**

- 1 CLEAN OUT YOUR PLANT SCRAP.**  
This is a job that every company can do. Old, worn-out or out-moded and replaced machinery and equipment, rails, structural parts,

etc. constitute the "heavy melting scrap" which the steel industry needs most. Clean up *your* plant and yards—move out this heavy scrap into the channels of use.

- 2 HURRY BACK YOUR WORKING SCRAP.**  
Don't let the waste of metal-working—turnings, borings, punchings, crop ends, etc.—lie around the plant a day longer than necessary. Keep it moving, back to the furnaces. And doubly important, *be sure to classify and segregate your alloy steel scrap.* Thus handled, it not only commands a higher price, but will help to conserve the nation's supply of critical alloys, practically all of which are highly essential.

*Contributed in the National Interest by*

# **ALLEGHENY LUDLUM STEEL CORPORATION**

Henry W. Oliver Building • Pittsburgh 22, Penna.

# WOODWORTH

## *Navlide* GAGES



The surface hardness of Woodworth NAWLIDG Gages is equivalent to that of Tungsten Carbide gages . . . and the cost per gage is one third as much! . . . In other words, NAWLIDG Gages will check three times as many parts per dollar as any other gage. . . . These laboratory and shop test statistics were furnished by Woodworth customers. . . . It will be profitable for you to write for details and investigate NAWLIDG. . . . Why don't you compare Woodworth NAWLIDG Gages with any other gage on the market today?

*Accuracy you can trust*

## WOODWORTH

N. A. WOODWORTH CO. • 1300 EAST NINE MILE ROAD • DETROIT 20, MICHIGAN  
PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS • PRECISION PARTS

**NEW** SLENDERIZED GRINDER  
ESPECIALLY DESIGNED  
FOR THE DIFFICULT  
GRINDING JOBS.



Wide clearance  
around wheels permits  
the grinding of odd-  
shaped pieces.

Slender Motor frame  
much smaller in diam-  
eter than grinding wheels  
permits across-the-  
frame grinding.

**BALDOR GRINDER**

No. 600

BACKED UP BY OVER  
30 YEARS GRINDER  
MANUFACTURING  
EXPERIENCE

$\frac{1}{4}$  H.P.  
No. 619

**\$4100**

**FOR FAST, ACCURATE GRINDING OF  
IRREGULAR AND ODD-SHAPED PIECES**

This new BALDOR GRINDER No. 619 is powered with capacitor-start, capacitor-run motor ( $\frac{1}{3}$  or  $\frac{1}{4}$  h.p., 3400 r.p.m.) which will not burn out even though repeatedly overloaded. Ball-bearings lubricated for life. 6" wheels equipped with Baldor patented weights for perfect balance. Adjustable steel tool rests.

**Baldor**

**TEAR OUT THIS AD**

as a reminder to write us for Bulletin  
349-A containing complete details.

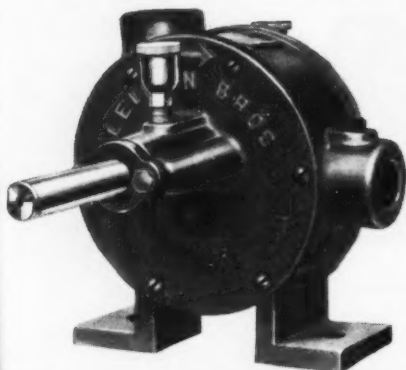
**ELECTRIC COMPANY**

4353 DUNCAN AVE. • ST. LOUIS 10, MO.

All these are  
**"LOW PRESSURE"**  
 AIR JOBS

Agitating—blowing—holding—  
 chucking—sorting—cleaning—drying—  
 cooling—separating—mixing—feeding—  
 leak-testing—pressure-boosting—  
 materials transfer, etc.

**—handled better, at lower cost, with**



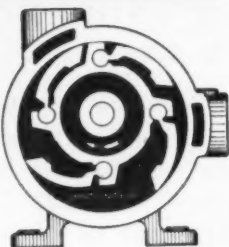
## LEIMAN AIR PUMPS

(Pressure, Vacuum, Suction)

On hundreds of air applications requiring pressures lower than 25 p.s.i. or vacuum under 29" mercury, Leiman Rotary Positive Air Pumps are providing these advantages over any other source of air:

### TAKE UP THEIR OWN WEAR

Exclusive Leiman hinged wing design permits wings to wear uniformly, maintaining full pressure or vacuum, after 15 and 20 years' steady service.



- Even, pulseless flow of air.
- No expensive installation, no tanks.
- Air available instantly—no waiting to build up pressure.
- No waste—runs only when air is needed.
- Very compact and portable—plug in and use anywhere.
- Provides both pressure and vacuum-suction from same source, by switching from outlet to inlet.
- Extremely quiet and trouble-free for years.
- Little or no maintenance.

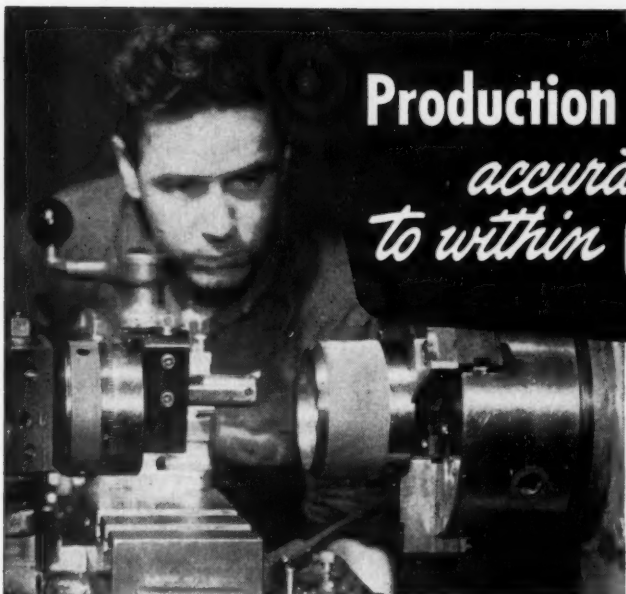
WRITE on firm letterhead, for free catalog and application folder.

**LEIMAN BROS., Inc.**

173 Christie St., Newark 5, N. J.

*What is your operation or problem?  
 Send us details for recommendation,  
 without obligation.*

**AIR PUMPS • AIR MOTORS • SAND BLASTS • DUST COLLECTORS**



# Production Boring *accurate to within 0.0001*

## With New Improved E-Z Set Boring Tools!

Here is a tool to end your precision boring problems. E-Z Set boring tools are accurate to within 0.0001" . . . employ micrometer-type adjustment . . . facilitate rapid and accurate set-up . . . utilize interchangeable shanks for application with any machine tool . . . and have a wide range of adjustability to meet specific requirements for any precision boring job.

MAXWELL E-Z Set boring tools feature increased tool rigidity through utilization of larger dove-tail areas and ground-fit male and female dove-tail sections.

E-Z Set Boring tools are available in three models having maximum boring bar capacities of 1/2, 1 and 1 1/2 inches. They cover a boring range of from 3/8 to 20 inches. Boring bars and socket keys are furnished as standard equipment.

WRITE TODAY FOR CATALOG



- ✓ Micrometer adjustment
- ✓ Boring range to 20"
- ✓ Interchangeable shanks
- ✓ Universally adaptable



216-MC

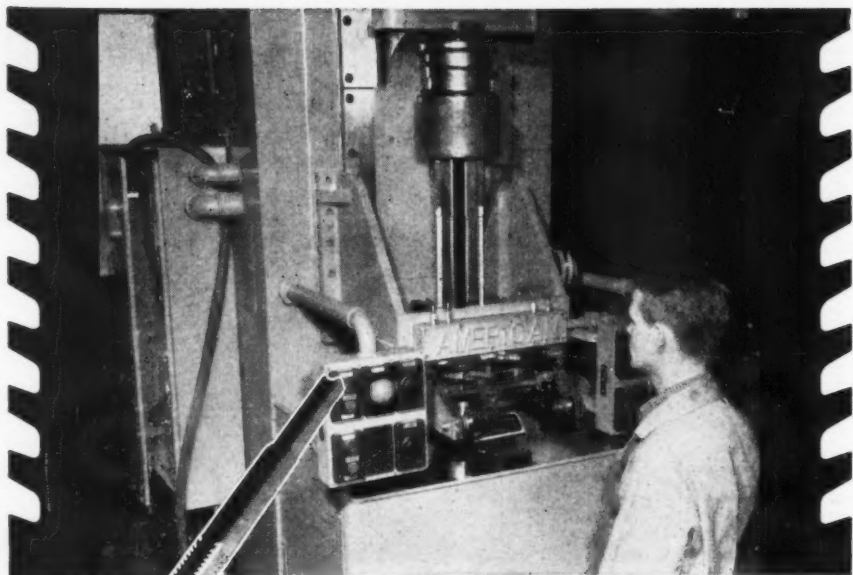
# THE MAXWELL COMPANY

221 BROADWAY

BEDFORD, OHIO

December, 1951

75



**ONE PASS *Broaches* SIX WINDOW OPENINGS**  
**Typical result engineered the AMERICAN way**

A special, large, American-engineered, automatic, six station pull head, on a standard American VP 3-10-30 Vertical broaching machine, helps to speed production on this automatic transmission part. A total of twelve angular sides, plus twenty-four corner radii are finish broached on 150 of these steel forged parts per hour. The machine is equipped with an American-engineered fixture with a manually operated work slide interlocked with the machine cycle for maximum safety.

Developing jobs of this type is an everyday occurrence at American Broach. Your broaching job benefits from the skill and experience of American engineers . . . engineers who design all three . . . broaches, broaching machines and broaching fixtures. Remember, the best way to do your job within cost and production requirements . . . is the American Way.

Write for our new Blue & Gold catalog containing complete machine specifications. Address Dept. B.



**American** BROACH & MACHINE CO.

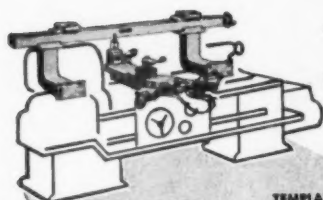
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

ANN ARBOR, MICHIGAN

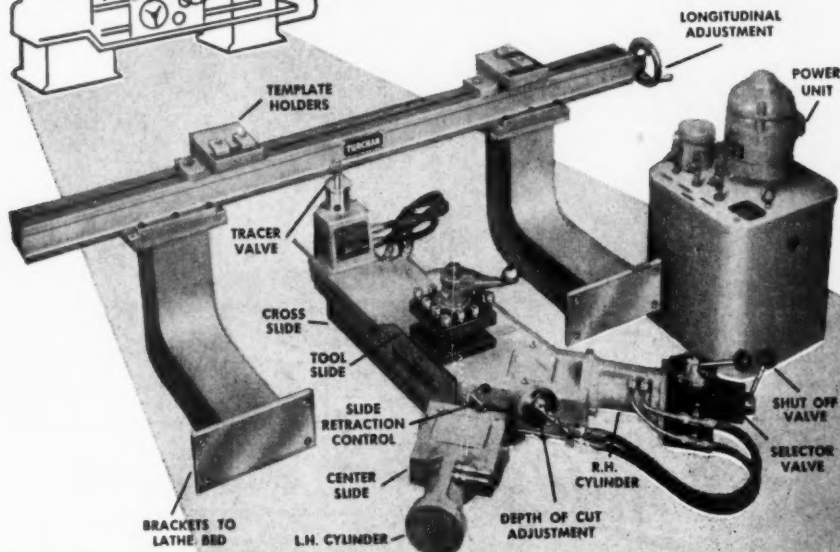
See *American First* for the Best in Broaching Tools, Broaching Machines, Special Machinery



# Greatest advance in turning since the invention of the metal working lathe!



**Turchan hydraulic dual duplicator  
gives 4 to 6 times faster production**

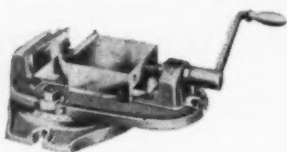


Just add this Turchan dual-turning follower to your standard lathes and watch the costs go down! No more need for costly special form tools. No skilled help required. Job set-up time can be cut to a small fraction. A cross slide equipped with two compounds at 45° to center line and 90° to each other replaces the conventional arrangement, allowing a new combination of movements. The 45° compound movements are controlled through a tracer, guided by template or full size model.

while the cross and longitudinal travels are obtained with the regular lead screws. This doubles tool approach to the work. Only one slide at a time is controlled by the tracer. Machining of right or left square shoulders, bevels, tapers, steps, undercuts, radii, and contour facing is easily accomplished. All this faster, more accurately (to .001"). Also other Turchan Followers available for milling machines, planers, shapers and grinders. "Turn to Turchan to cut costs."

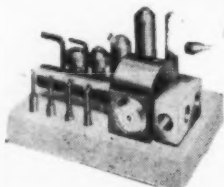
OLDEST MANUFACTURER OF HYDRAULIC ATTACHMENTS FOR MACHINE TOOLS

**Get All the Facts — Write for Descriptive Booklet**



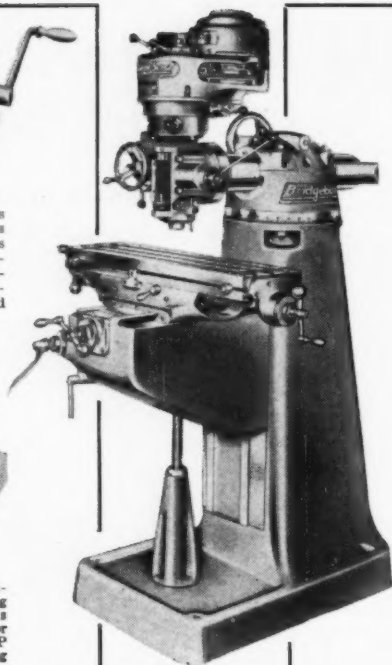
**Milling Machine Vise**

This improved vise provides great gripping power, is streamlined for attractiveness and is equipped with a coolant trough. A large diameter screw assures rigid holding. Two sizes: 5"x3½" and 6"x5" jaw openings.



**No. 2 Boring Head**

Boring tools and holder provide the means of boring holes up to 6" diameter. This attachment is available for use on the Bridgeport 1 HP Milling, Drilling and Boring Attachment.



**Heavy Duty Right Angle Attachment . . .**  
for milling and drilling at right angles. Fits both Master and 1 HP Bridgeport Heads



**Light Duty Right Angle Attachment . . .**  
designed for right angle milling and drilling narrow, deep molds and cavities.

## EXCLUSIVE FEATURES OF

# Bridgeport

**. . . assuring greater  
convenience, speed, versatility  
and accuracy**

May we emphasize a statement recently made in these pages, to wit: Bridgeport and Bridgeport only provides the means of milling, drilling, boring and shaping with the ability to position the drilling head over a wide area in two planes, without changing set up.

Complete details on Machine and Attachments available promptly on request.

## TURRET MILLING MACHINES

This outstanding exclusive feature accounts for the universal popularity of Bridgeport Turret Milling Machines. Economies effected by its use and the better work produced make many existing machines and methods obsolete. Tool rooms, die shops and production lines are being modernized every day through the installation of these time-and cost-cutting machine tools.

### Condensed Specifications

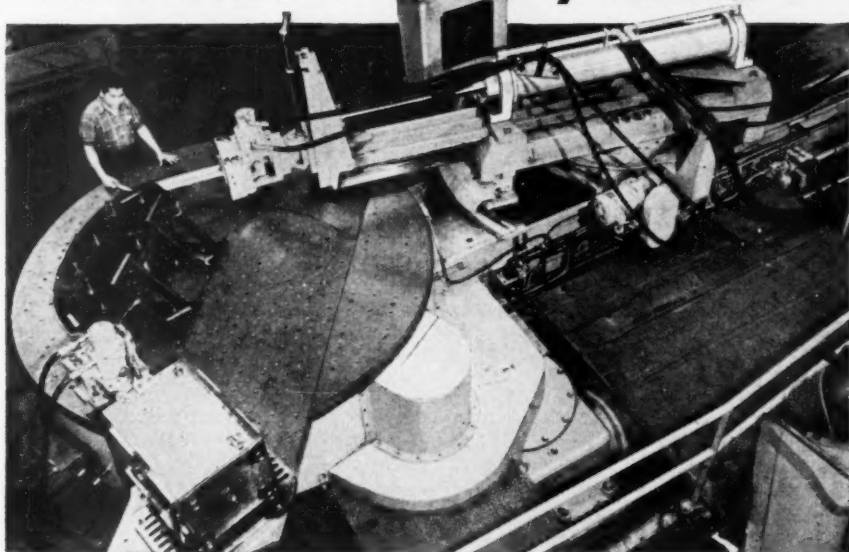
8 Spindle Speeds from 80 to 2720 RPM.  
Back Geared Spindle Drive Unit: utilizes full power at all speeds without belt slippage.  
Quill Travel: 5".  
Power Feed to Quill in 3 steps: .0015, .003 and .006 in. per spindle revolution.  
Spindle Brake and Lock for convenience in changing tools.  
Collet Capacity: up to ⅝" diam.

# Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

## 50-Ton Contour-Former Employs Giant NOPAK Cylinder



Built by the Cyril Bath Co., Cleveland O., this powerful machine is used to shape curved aluminum airplane fuselage parts. A NOPAK Model "A" 10" x 80" Hydraulic Cylinder . . . operating at 1500 P.S.I. . . . works in conjunction with the forming die, mounted on a gear-driven turntable, to stretch-form an infinite number of curved structurals . . . with 700 different dies now in use.

Very likely the efficiency of machines you build or use can be stepped up substantially through the correct use of NOPAK Valves and Cylinders.

GALLAND-HENNING MFG. CO., 2754 S. 31st Street, Milwaukee 46, Wis.

•  
Refer to Sweet's File for  
Product Designers or write for  
Bulletin SW-1  
•

**NOPAK**  
**VALVES AND CYLINDERS**  
DESIGNED for AIR and HYDRAULIC SERVICE  
A 5984-1/21-A

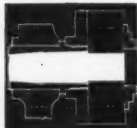
# SOUTH BEND

## SERIES 1000 PRECISION TURRET LATHE

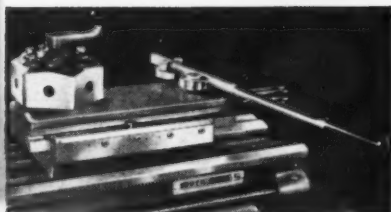
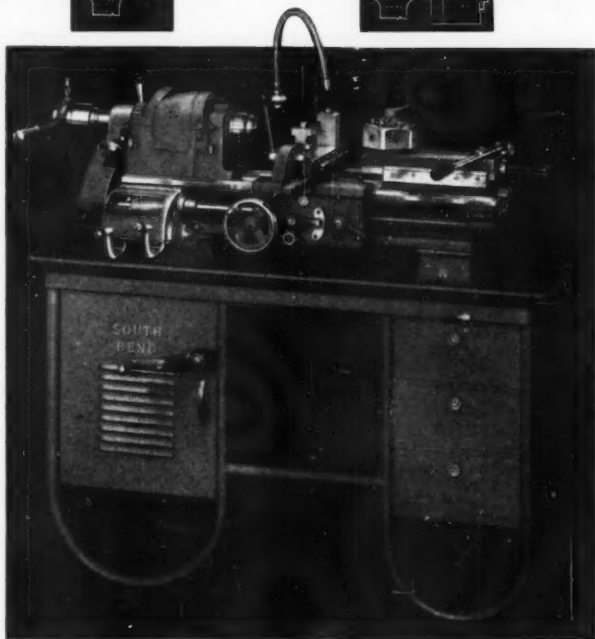
This precision turret lathe meets the demand for fast, efficient production of small precision parts. It has the accuracy for close-tolerance operations; ample power for smooth performance; and rigidity for producing a fine finish. Especially practical for second operation work of many types.



1" COLLET  
CAPACITY



1-3/8"  
SPINDLE  
BORE



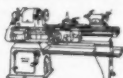
### HANDLEVER BED TURRET

Turret will index within plus or minus .0005" at 4" from turret face. Turret head may be back-indexed or spun to skip tool positions. Individual feed-stop screws. Maximum distance between spindle nose and turret face is 19-3/8" at start of indexing.

#### SEND INFORMATION CHECKED:

☐


☐ 9" and 10"  
BENCH LATHES



☐ 10" to 16-3/4"  
FLOOR LATHES



☐ 1/2" and 1" Collet  
TURRET LATHES



☐ DRILL PRESSES



☐ BENCH SHAPERS

Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City & State \_\_\_\_\_

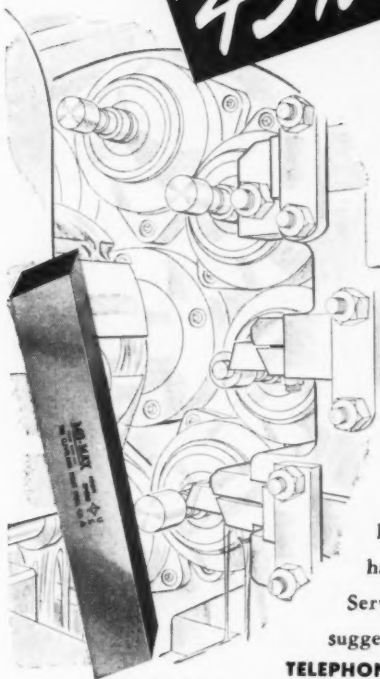
Building Better Tools Since 1906 • SOUTH BEND LATHE • South Bend 22, Indiana



Test proves you get

**43% MORE PRODUCTION**  
with

## **MO-MAX TOOL BITS**



On three operations in the set-up pictured here—machining nickel-moly steel (4615) at 135 to 150 s.f.m.—the superintendent kept careful records of tool performance. It was found that MO-MAX COBALT High Speed Ground Tool Bits ran 43% to 100% longer than the tool bits previously used. ♦ In the break-down operation MO-MAX ran 4 hours, as compared with 2 hours for the other steel. In facing, it was 5 hours against 3½ hours. In cut-off, 4 against 2½. ♦ This is one of hundreds of tests in which both MO-MAX and MO-MAX COBALT Tool Bits have demonstrated their superiority. So if you have a difficult machining problem, a *Cleveland* Service Representative will be glad to give helpful suggestions. Contact our nearest Stockroom, or . . .

**TELEPHONE YOUR INDUSTRIAL SUPPLY DISTRIBUTOR**

1876 1951



THE MARK OF QUALITY  
FOR 75 YEARS

### **THE CLEVELAND TWIST DRILL CO.**

1242 East 49th Street

Cleveland 14, Ohio

Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 2 • San Francisco 5

Los Angeles 58 • London W. 3, England



ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS

# MARK IT FOR MARKET!



**CLEAN... LEGIBLE... PERMANENT...**

MODEL  
175  
HYDRAULIC



Identification **ROLLED** into your products will help you market them.

Hack Saw blade above has been permanently marked in a Model 175 Hydraulic Marking Machine using a solid engraved lettering knurl.

Your name, model number, part number, serial number or decorative designs can be rolled into your components to improve their appearance and facilitate identification.

Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

**WRITE FOR CATALOG**

**GEO. T. SCHMIDT, INC.**  
1802 W. BELLE PLAINE AVENUE  
CHICAGO • 13 • ILLINOIS

# MAGNETIC CHUCKS BY *Magna-Lock*

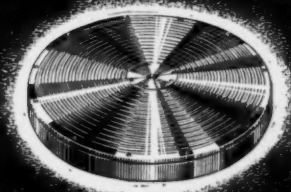
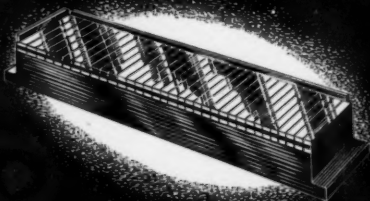
...largest exclusive builder of magnetic chucks

**3 TYPES**  
for every flat-  
surface machining  
job ... large or small!

**RECTANGULAR** ... work held  
to extreme edges of chuck. Sizes  
to 36" x 96"

**ROTARY** ... inserted ring-type,  
6¼" dia. to 48½" dia. Also  
sectional type for automatic  
loading, unloading.

**SWIVELING** ... for knife and  
shear blade grinding, many  
machining operations.



Get full details on  
Magna-Lock Mag-  
netic Chucks and  
Devices.

WRITE DEPT.  
MT-51

*Magna-Lock*

*Hanchett* **MAGNA-LOCK CORPORATION**

Magnetic Chucks and Devices

BIG RAPIDS

MICHIGAN, U. S. A.

**EFFICIENT  
ECONOMICAL**

**ROUGH GRINDING  
AND  
FINISH GRINDING**

**FOR OFFHAND  
GRINDING**

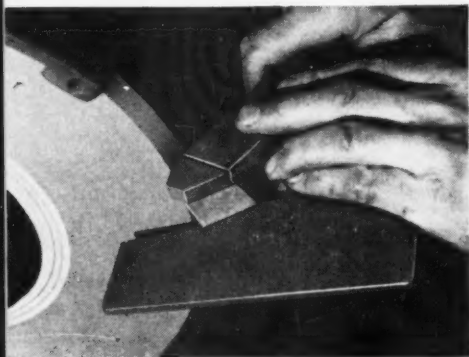
**FOR PRECISION  
GRINDING**

**made  
only by...**



# 'XL' BOND FOR CARBIDE TOOL AND CUTTER GRINDING

**Assures Efficient Performance at Far Lower Cost**



Chicago Wheel's "XL" Bond is the answer to today's acute shortage of grinding wheels for tool and cutter sharpening. Like all of Chicago Wheel's top-quality abrasive specialties — Mounted Wheels and Cut-off Wheels as well as Grinding Wheels—these "XL" Bond wheels are backed by over half a century of specialized experience. Write today for complete details.

It's really big news . . . this new "XL" Bond! "XL" is the name of Chicago Wheel's remarkable new line of silicon carbide vitrified grinding wheels . . . especially made for carbide tool and cutter grinding.

"XL" wheels come in the most popular tool and cutter sizes and steel backs. They're designed for efficient, economical, rough and finish grinding . . . offhand or precision automatic. And they're already proving themselves on the job, helping to keep the nation's carbide tools and cutters in first-class shape for the mobilization program. "XL" is unexcelled . . . and another 1st for Chicago Wheel!

Chicago Wheel & Mfg. Co., Dept. MT  
1101 West Monroe St., Chicago 7, Illinois

Please send us literature and engineering report on the new "XL" Bond Silicon Carbide Grinding Wheels.

Name

Firm

Address

City  Zone  State

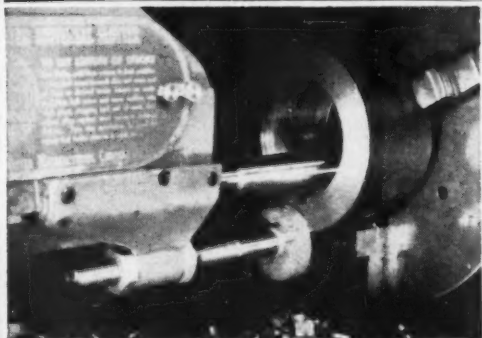
OFFICES IN PRINCIPAL INDUSTRIAL CENTERS

**CHICAGO WHEEL & MFG. CO.**

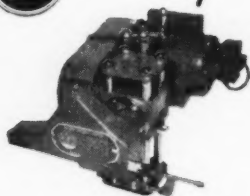
1101 West Monroe Street, Chicago 7, Illinois

**more  
OPERATIONS**

ON YOUR LATHE, TURRET, OR MILL  
with  
**MASTER MACHINE TOOL  
ATTACHMENTS**



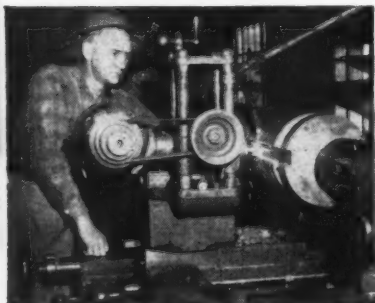
INTERNAL KEYWAY CUTTING WITH  
MASTER SLOTTING HEAD ON A LATHE



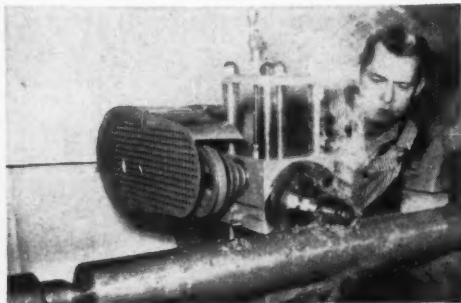
*Master Universal  
Slotting and Keyseating Head*

The multi-purpose Master milling, grinding and keyseating attachments increase the facilities and capacity of your lathes, turrets, or mills, in maintenance shops, tool rooms, as well as production shops. For the cost of one single-purpose machine, you can have several Master units producing on your present equipment.

**THREE SIZES:** Model "C,"  $\frac{1}{2}$  h. p. for 9" to 13"; Model "B,"  $\frac{1}{2}$  or  $\frac{3}{4}$  h. p. for 13" to 18"; Model "M," 1 or  $1\frac{1}{2}$  h. p. for 18" to 72" swing lathes.



END MILLING  $2\frac{1}{2}$ " KEYWAY IN  $9\frac{7}{8}$ "  
SHAFT 22 FT. LONG



$1\frac{1}{2}$  H.P. MODEL "M" ON LATHE MILL-  
ING  $\frac{1}{2}$ " KEYWAY 1 FT. PER MINUTE

WRITE FOR TWENTY-FOUR PAGE CATALOG

**MASTER MANUFACTURING CO.**  
1310 EAST AVENUE A ■ HUTCHINSON, KANSAS, U. S. A.

# For 100% Performance get "RED END" Power Hack-Saw Blades

... they're 100%  
**SIMONDS**  
Quality-Controlled

**Cut-ability** ... that's the word for "Red End" Power Blades! **Cut-ability** that starts with special Simonds hack-saw steel, double checked for toughness and grain structure. **Cut-ability** that proves out and *pays off* on the job with straight fast cuts and *more cuts per blade*. Supplied in all standard sizes with a choice of these two types of steel:

**High Speed Molybdenum** for cutting mild alloys and general work where breakage-resistance and long life are musts.

**High Speed Tungsten** for top cutting efficiency on toughest alloy steels where abrasion-resistance is vital.

Order Simonds "Red End" Power Blades from your Industrial Supply Distributor.



**SIMONDS**  
SAW AND STEEL CO.

Branch Offices in Boston, Chicago, San Francisco, and Portland, Ore. Canadian Factory in Montreal, Que.

# WE GO ALL OUT



*There is  
a Johnson  
Dealer  
Near You*

to Maintain High Machining  
Standards and Close Tolerances

## JOHNSON METAL CUT-OFF BAND SAWS

Accuracy in a saw depends entirely on the way it is built. . . . That's why we go the limit in maintaining high machining standards and close tolerances in the manufacture of Johnson Band Saws. **YOU CAN'T BUY A BETTER SAW THAN A JOHNSON.** For value, capacity, fast, continuous cutting action and economy, Johnson Saws lead the field. They will pay for themselves quickly and give dependable trouble-free service year after year.



*Model J, pictured, 10" x 18" Capacity, available as a wet or dry cutting machine. Also Junior Model B, (with or without casters) 5" x 10" Capacity.*

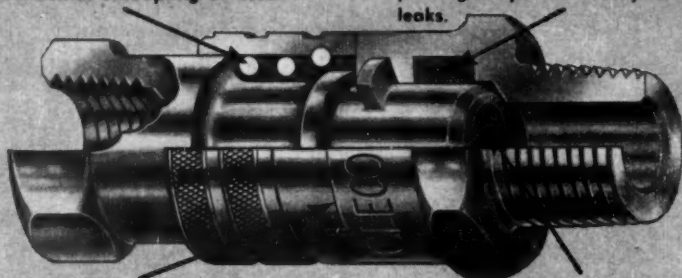
**JOHNSON MANUFACTURING CORP.**  
**ALBION, MICHIGAN**

1. **POSITIVE LOCKING.** Spring loaded locking ring prevents accidental uncoupling of hose.

2. **PRESSURE-SEAL PACKING.** Line pressure expands lip-type packing to prevent costly air leaks.

3. **QUARTER-TURN OPERATION** Instant coupling and uncoupling saves operator's time and management's money.

4. **FULL-OPENING.** Cleco Couplings pass full line pressure to the tools, assuring fast, efficient operation and lowest production costs.



## *four* reasons why your air lines should have **CLECO COUPLINGS**

**CLECO MAKES A  
COMPLETE LINE OF  
AIR LINE FITTINGS**

•  
**WRITE FOR BULLETIN  
No. HF-747**

Cleco Couplings make air tools more profitable. They prevent leaks and deliver full air pressure to the tools. They have a long useful life and they are not easily damaged by ordinary handling.

Made in either brass or steel. The steel couplings are cadmium plated to prevent rust.

Cleco Couplings are made in a complete range of sizes from 1/4" to 1 1/4". Write for full information.



### **CLECO DIVISION**

**of the REED ROLLER BIT COMPANY**

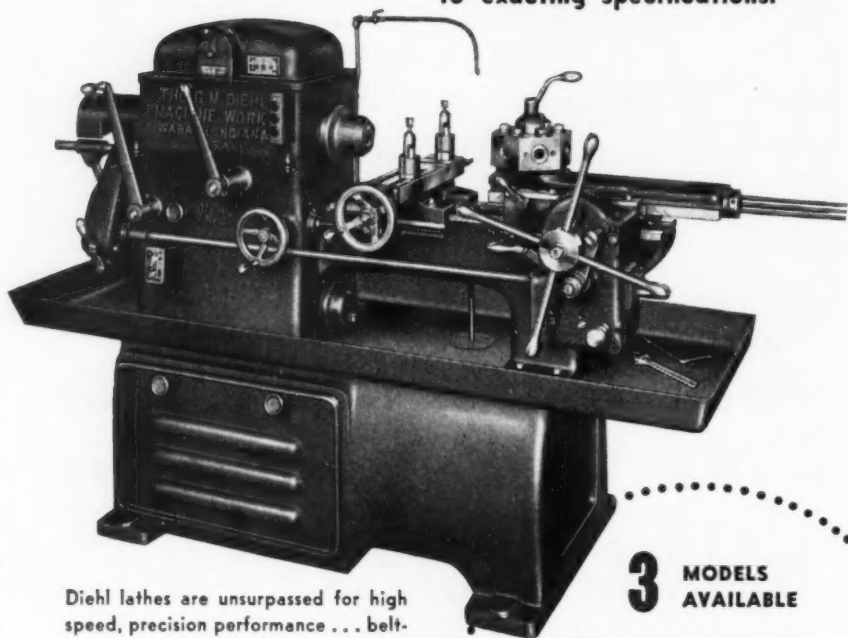
**5125 CLINTON DRIVE**

**HOUSTON 20, TEXAS**



# Diehl <sup>NO</sup> 2 TURRET LATHES

assure accurate, smooth cutting  
to exacting specifications.



## 3 MODELS AVAILABLE

Diehl lathes are unsurpassed for high speed, precision performance . . . belt-driven transmission of power to assure smooth, accurate cutting to rigid specifications. Diehl No. 2 Lathes are standard size and use same tooling, including collets, as other standard No. 2 sizes. They give years of economical, vibration-free service with ample power for extreme production requirements.

- Power Feed to Turret—Screw Feed Cross Slide
- Power Feed to Turret—Lever Feed Cross Slide
- Hand Feed to Turret—Lever Feed Cross Slide

Automatic Chuck Capacity (round) . . . . . 1"  
Swing-over cross slide . . . . . 6"  
Swing-over bed . . . . . 14"  
Six speeds . . . . . forward and reverse

● Write for illustrated literature and specifications.

## The G. M. Diehl Machine Works, Inc.

WABASH, INDIANA, U. S. A.

# IF YOU COULD SEE A DoALL surface grinding demonstration

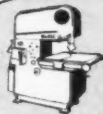


**"Cool Grinding" Multiplies  
DoALL Grinding Efficiency**  
With the DoALL "Cool Grinding"  
attachment,\* coolant flows  
through the wheel and out in a  
fine mist at the point of work.  
This gives:

1. Faster stock removal.
  2. Accurate dimensional control.
  3. Freedom from cracks or burns.
  4. Longer wheel life.
- You can do precision grinding  
faster and better with DoALL  
"Cool Grinding." No special  
wheels, tanks or pumps needed.  
Ask about it!  
\*Pat. No. (2470350)

SEND FOR BULLETIN

GR4-S



Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

YOU would witness DoALL precision surface grinders do *any* surface grinding job better, faster. You could run this test:

1. Take a .020" cut in a piece of hardened tool steel. Halfway across the work reverse the crossfeed and you'll find NO "sparkout." Work is ground flat in one operation. The machine is so rigid you can take a heavy cut without fear of spindle "give" or "spring."
2. Stop the work under the wheel and without raising wheel stop the motor. The wheel coasts to a stop without touching the work surface. It took all the metal intended in one clean pass.
3. Pencil mark the work surface. By lowering the wheel .0001" only the pencil marks are removed. DoALL grinders are rigid but when you adjust the vertical column support the machine obeys — no "hang up."



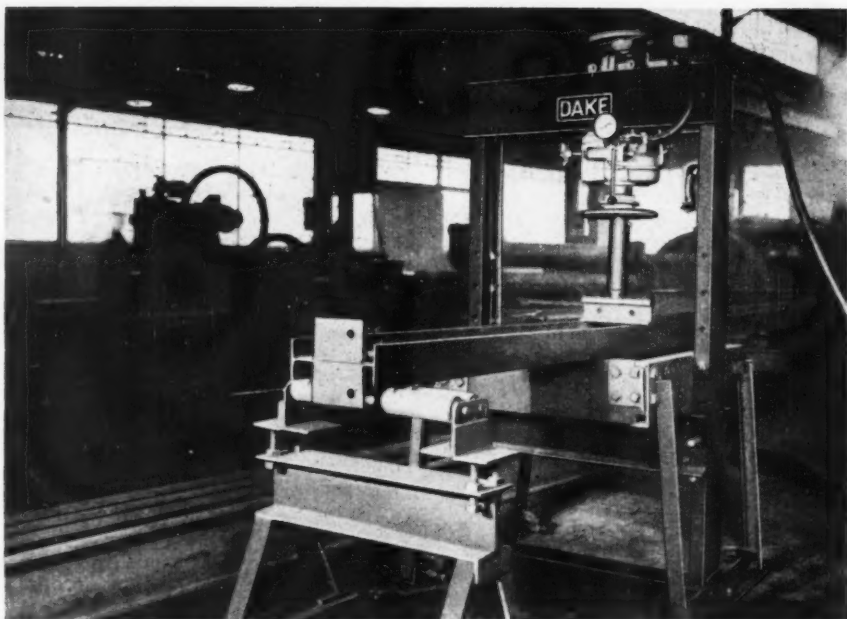
YOU can have this demonstration FREE in your own plant, at your convenience. See for yourself how DoALL rigid precision hydraulic surface grinding can help you. Ask for FREE DEMONSTRATION. Call your DoALL Store or write:

**The DoALL Company**  
254 N. Laurel Ave.  
Des Plaines, Ill.

INDUSTRY'S  
NEW  
TOOLS

**DoALL**

33  
SALES-  
SERVICE  
STORES



# *Straightening Time Cut 66%*

**by Using a Standard Model Dake Press**

When a steel fabricating company recently sought a faster way to straighten welded I-beams and channels, first reports indicated that special equipment would have to be built for the job.

Dake engineers advised otherwise: "By equipping our standard 50-ton air-operated press with a special table and screw nose," they said, "straightening costs should be reduced materially on all your structural work."

The company bought the press and

adapted it to the job. As a result... straightening time was reduced 66%, and the press paid for itself in the first two months of use.

If you have any kind of straightening, bending, or pressing jobs, consider a regular Dake Press first. Dake engineers will advise if your situation requires custom-engineered equipment.

The complete line of standard model Dake Presses is illustrated and described in a folder which we will gladly send you. Write for it, today.

Dake Engine Company, 608 Seventh St., Grand Haven, Michigan

**DAKE**

air and hydraulic  
**PRESSES**



Single  
Leverage



Compound  
Leverage



Hand-Operated  
Hydraulic



Air-Operated  
Hydraulic

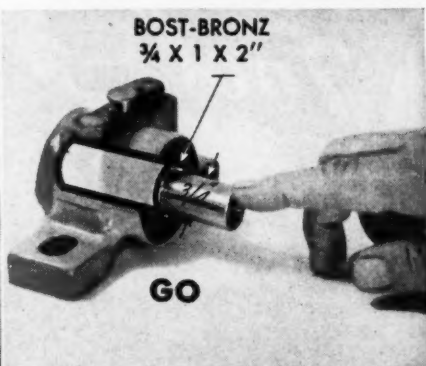
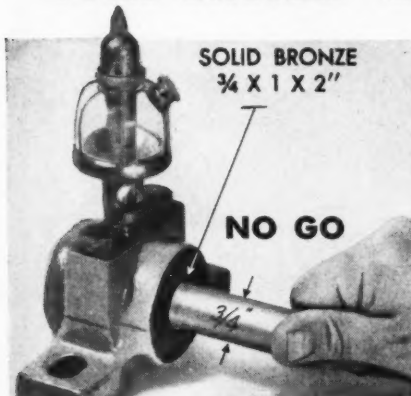


Elec-Hydraulic

**\$3.32**  
**SOLID BRONZE**

**vs.**  
**SAME**  
**SIZE**

**\$.90**  
**BOST-BRONZ®**



COST OF BEARING	\$ .87
REAMING	.70
GROOVING	1.40
DRILLING	.35
COST OF MACHINING	2.45

**NO GO \$3.32**

COST OF BEARING	\$ .90
REAMING	NOT NECESSARY .00
GROOVING	NOT NECESSARY .00
DRILLING	NOT NECESSARY .00
COST OF MACHINING	.00

**GO \$.90**

1. BOST-BRONZ requires . . . **NO REAMING**    **NO GROOVING**    **NO DRILLING**
2. BOST-BRONZ gives better service and lasts longer, whether loads are heavy or light, static or shock.
3. BOST-BRONZ is cleaner — no oil drip or waste, no openings for grit, lint or dirt.



**IN STOCK 589 SIZES**    *Cylindrical Flanged*    **BEARINGS • BARS • PLATE**

Write for a FREE Sample!

**BOSTON GEAR WORKS**

77 HAYWARD ST., QUINCY 71, MASS.

For information and prices on over 2000 types and sizes, contact Boston Gear Company Inc. 65, Free copy on request.

**BOST-BRONZ is stocked by 85 Authorized Boston Gear Distributors — One Near You**

# R AND L

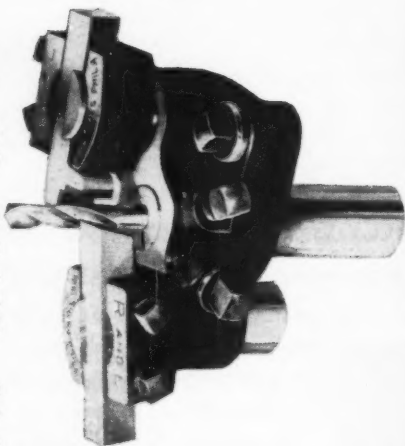
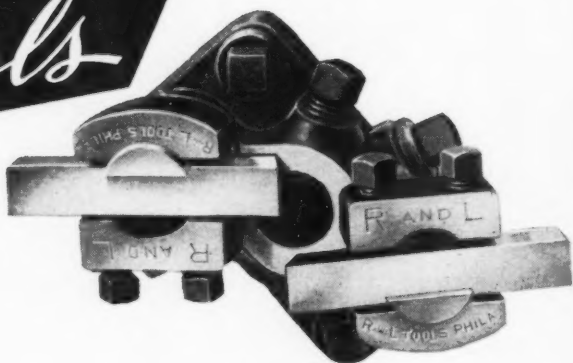
# Tools

## THE FOUNDATION OF ECONOMICAL SCREW MACHINE WORK

Get yourself acquainted with the R and L Turning Tool and you'll learn the reason for its usefulness and large demand.

Adjustable to work on right or left hand turning spindles, it can, with its extra parts, be used for single point turning with backrest, centering and facing, knee tool work, pointing, backrest, floating drill holder or as a balanced turning tool.

Ask for the new 28 page R and L Tools catalog showing examples of the many time and tool saving operations that can be done with this single tool.



# R AND L TOOLS

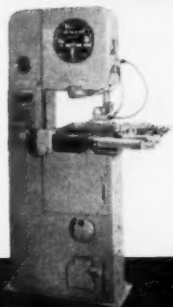
1825 BRISTOL ST., PHILA., PA.

TURNING TOOL—UNIVERSAL TOOL POST—FLOATING DRILL HOLDER—CARBIDE AND  
ROLLER BACKSETS—EVOLVING STOCK STOP—TAP AND DIE HOLDER—CUT-OFF BLADE  
HOLDER—TURNING BACKREST HOLDER—RELEASING ACORN DIE HOLDER—KNURLING  
TOOL—RECESSING TOOL

# THERE IS A DoALL BAND MACHINE FOR EVERY PURPOSE AND EVERY POCKETBOOK



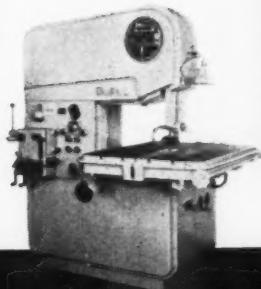
**"UTILITY" BAND SAWING AND  
FILING MACHINES**—Four models  
—16" throat. Two speed range 50  
to 350 F.P.M. and 860 to 5200  
F.P.M. Also available fixed speed.  
For small shops and experimental  
or model work in large shops.



**"ML" CONTOUR MACHINES**—Five  
models—Precision machines for  
general purpose band sawing, fil-  
ing, polishing. 50 to 1500 F.P.M.  
variable speed for conventional  
metal cutting. Throats 16" to 60".



**HIGH SPEED "ZEPHYR" MA-  
CHINES**—High speed 500 to 15000  
F.P.M., fixed or variable. 16" to  
60" throats. For high speed saw-  
ing of non-ferrous metals and  
non-metallics, friction cutting fer-  
rous sheet, plate up to 1".



**THE "CONTOUR-MATIC"**—The fea-  
tures and capabilities of all other  
models plus hydraulic controls,  
wider speed range, more power,  
greater tool variety, etc. Cuts any  
material, any shape. Use as all-  
purpose or single purpose tool—  
works faster, better, cuts costs,  
increases output per man.

**EVERY SHOP** can have the benefits of DoALL band machining, the fast, economical process that "slices" material apart instead of reducing it to pile of chips. There is a DoALL Band Machine and Band Tool for precision cutting every material, every shape—sawing, line grinding, polishing, honing, friction sawing, cutting. For production, for maintenance, for toolmaking—a DoALL will save manhours, material and money, free other machines for work to which they are better suited. Ask to have a **free DEMONSTRATION** right in your plant. Call your local DoALL Sales-Service Store or write:

The DoALL Company, 254 N. Laurel Ave., Des Plaines, Ill.

SEND FOR CATALOG    

Learn about the complete machining facilities offered by modern DoALL Band Machines.



## DoALL



**CALL DoALL FOR:**

B-35

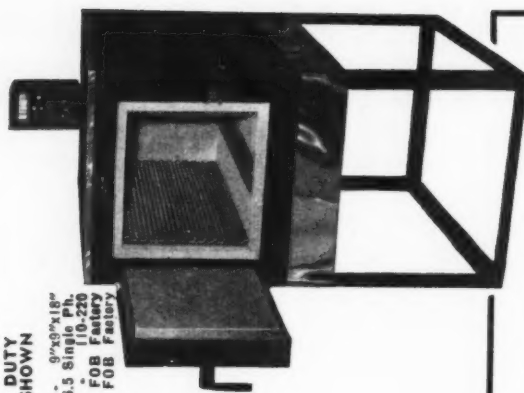


Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supply

# THIS LUCIFER ELECTRIC FURNACE SAVES YOU MONEY 3 WAYS

## DOUBLE DUTY MODEL SHOWN

7055-B  
Muffle Size - 9"x9"x18"  
KW Rating - 6.3 Single Ph.  
Voltage AC - 110-220  
2000' \$647.50 FOB Factory  
2300' \$764.25 FOB Factory



## SAVE ON FIRST COST

Despite highest quality workmanship and costliest materials and refractory, LUCIFER furnaces are lower in price. Model for model, you pay less for a LUCIFER.

## SAVE ON OPERATING COSTS

Electronically controlled, LUCIFER Furnaces achieve desired temperature rapidly, then "hold" at that temperature. Less operator attention required. Long lasting elements make down time a rarity.

## SAVE ON INCREASED PRODUCTION

Reports from users laud the LUCIFER controlled temperatures for ease of operation, fewer rejects, simplified production advantages.

WRITE FOR FREE DATA AND ENGINEERING HELP. 30 DAY DELIVERY.

SPECIAL MODELS DEVELOPED FOR PRODUCTION RUNS.

**THE GILBERT S. SIMONSKI COMPANY**

ROUTE No. 61, NESHAMINY, PENNA. PHONE HATBORO 0411

*Sole Manufacturers of Lucifer Electric Furnaces*

## DATA ON OTHER LUCIFER MODELS, 2300' RANGE

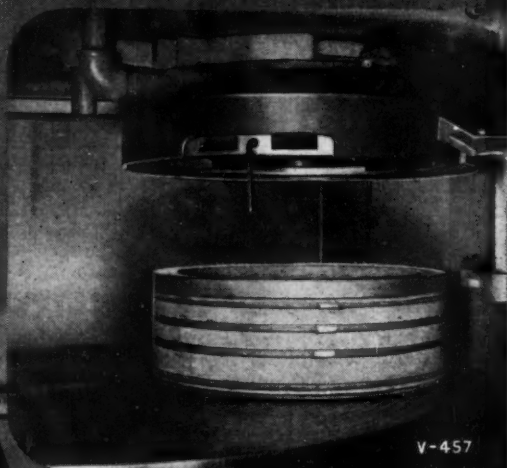
Model	Muffle Size	KW Rating	Cost
7055-A	6"x 6"x12"	3.5 Single Phase	\$467.00
7055-C	12"x12"x24"	13 Single Phase	\$912.00
7055-D	18"x18"x36"	16.5 or 28 3 Ph.	\$1419.75

(Lower prices on models in 2000' range)

for your BLANCHARD

*So easy!*

lower head  
onto wheel  
and clamp-



V-457

-then grind!

Blanchard wheels are engi-  
neered for Blanchard Grinding

The NEW Blanchard Wheel Holder eliminates sulphur-  
ing — try it with Blanchard wheels and be convinced  
that it will —

**SAVE TIME  
SAVE MONEY  
SAVE TROUBLE**

*See your Blanchard distributor or  
write direct for full information!*

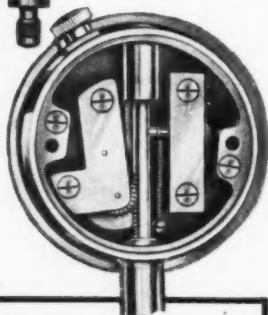
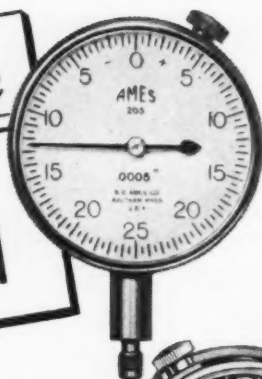
PUT IT ON THE

**BLANCHARD**

THE BLANCHARD MACHINE COMPANY

14 STATE ST., CAMBRIDGE 28, MASS., U.S.A.

# Modern Design SPEEDS PRODUCTION

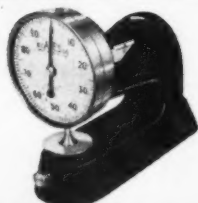


● Ames micrometer dial indicators are the most modern available today — and naturally so because Ames policy for over 50 years has been continually to improve design, to take advantage of new materials and to utilize the most advanced manufacturing methods. They are a real aid to the quality control engineer who is trying to keep pace with today's high production schedules.

Because Ames Indicators are functionally designed, they have fewer parts than ordinary indicators. Construction is simple with functional parts being larger and more rugged and adequately supported. Operational friction is at a minimum. Thus, Ames Indicators combine extreme sensitivity and accuracy with the ability and endurance *to stay right on the job longer.*

✓ Check this list of features . . .

- 1 Forged Solid Brass Case and Stem
- 2 Heavy Brass Plate
- 3 Coarse Pitch Stainless Steel Rack
- 4 Hardened and Burnished Steel Pivots
- 5 Dials Printed from Steel Engravings
- 6 Patented Bezel Assembly



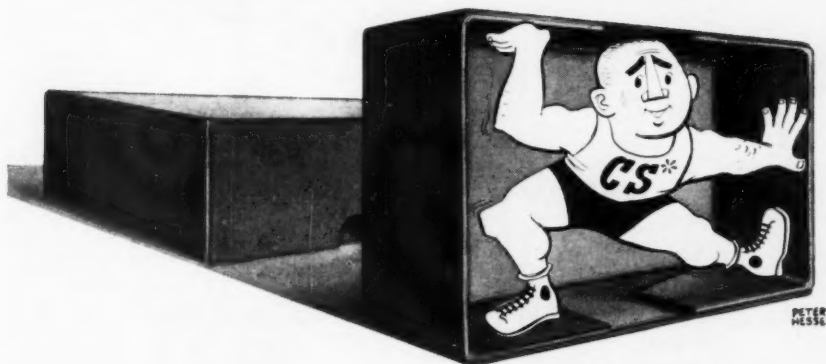
Representatives in  
principal cities.

**B. C. AMES CO.**

28 Ames Street  
Waltham 54, Mass.

Mfr. of Micrometer Dial Gauges • Micrometer Dial Indicators


IN MADE-RITE MAILING BOXES



# Creased Strength

## MEANS INCREASED STRENGTH

The toughest mailing box of them all . . . C. S.\* Buffinton Made-Rite Mailers. Tough . . . but with just enough flexibility to protect your product, prevent the box from buckling or splitting open under sudden shocks.

 Creased Strength spells the difference. See how the folds are creased for extra strength, not weakened by scoring or grooving. Double thickness along the rugged Kraft board sides (triple at the corners!) insure added protection without added weight.

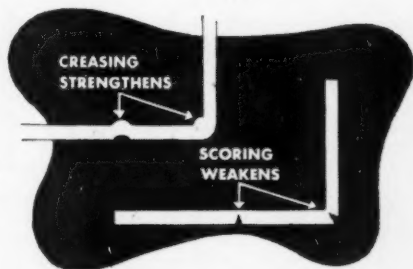
### TOPS IN ECONOMY TOO!

We'll prove C. S.\* Made-Rite Boxes cut mailing costs! Write for your FREE box-full of C. S.\* today!



**BUFFINTON MADE-RITE BOX COMPANY**

134 Thurbers Ave., Providence 5, R. I.



**BUFFINTON MADE-RITE BOX COMPANY**  
134 Thurbers Ave., Prov. 5, R. I.

Please RUSH my C. S.\* Made-Rite Mailer and complete information.

Name

Firm Name

Address

City  State

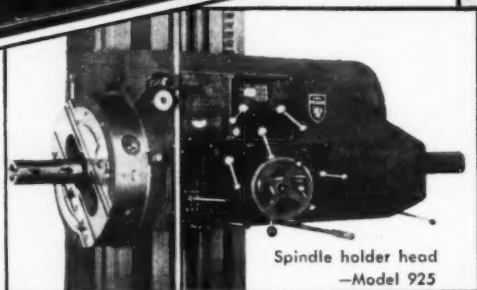
*Outstanding Value  
in Precision Horizontal Boring Mills*

**PEGARD  
HORIZONTAL  
BORING MILL**

*Known the world-over*



**CENTRALIZED  
CONTROL**



**HIGH PRECISION** in an almost limitless range of operations!

MODEL 924—3-1/8" spindle diameter

MODEL 925—3-15/16" spindle diameter

**BUILT TO ASME STANDARDS—AVAILABLE FOR EARLY DELIVERY!**

*Ask for illustrated circular giving full details.*

**MOREY MACHINERY CO., Inc.**  
**NEW MACHINERY DIVISION**

410 Broome St., New York 13, N. Y.

CAnal 6-7400

EXCLUSIVE AMERICAN REPRESENTATIVE — SALES TERRITORIES OPEN



#### COST CUTTING FEATURES OF PINES BENDERS

- Produces Accurate Uniform Bends without marking or distorting.
- Push-Button Control — simple, easy for one man to operate.
- Highly Versatile — handles wide variety of work — serpentine, coil, compound or multiple bends.
- Fast Set-Ups — tool changes in 10 minutes.
- Superior Design — tapered alloy-steel spindle, adjustable gibs, Timken bearings, Vickers pump.

THE Pines principle of bending piping, tubing, extruded or rolled sections and mouldings, employs tested and proven methods that assure best results and peak production. Roll, compression, draw, and stretch bending methods are skillfully adapted to best suit your material and product needs. Hydraulic power, push-button control and automatic operation is combined to assure high efficiency and lower production costs. Ask Pines to analyze your bending problems now. Phone Aurora 2-7608.

#### WRITE FOR FREE LITERATURE

Find out how the Pines Benders are designed to save time and cut costs. Literature describes and pictures various models, attachments, and methods on actual jobs.



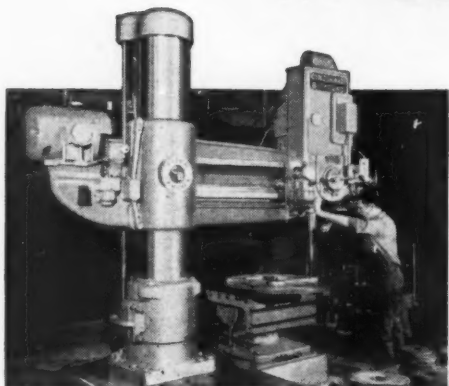
**PINES** ENGINEERING CO., Inc.

*Specialists in Tube Fabricating Equipment*

698 WALNUT

AURORA, ILLINOIS

# Now *one hour's work,* in **40 minutes**



Notice the use of the strong and accurately built universal table. It is used here on a base extension especially provided so that the main base can remain available for big work. Convenient controls, always within easy reach of the operator, thirty-six speeds and eighteen feeds, combine to make available the right combination for the drilling, tapping, reaming or counter-boring tool involved.

Correct, safe manipulation is easy on the SUPER SERVICE Radial. For further information on the many exclusive features of the SUPER SERVICE Radial, write for Booklet R-29.



**THE CINCINNATI BICKFORD TOOL CO.** Cincinnati 9, Ohio U.S.A.

# AS THE *Editor* SEES IT

## Manpower in the government

Defense production bottlenecks, once merely a possibility, are now an actuality in many industries. Reasons for these bottlenecks are manifold and no one reason can be singled out as the culprit and run out of town on a rail. However, one important contributing factor to hesitant production schedules, according to industry, is the low caliber of government personnel acting as liaison between the military and the manufacturers.

Now, before any defense material can be produced satisfactorily, there must be a meeting of the minds between industry and the military as to How, Where, and When the material will be produced. Unless this meeting is consummated between men on an equal level of competence, production cannot get under way efficiently.

This absence of competent personnel to meet with industry is a grave problem of which our more enlightened public servants are well aware. To charge all government workers with incompetence is naturally ridiculous; hundreds of highly trained men are laboring long and unselfishly against great odds to do their jobs well. Unfortunately, the defense program flowered so quickly that thousands of men had to be recruited quickly from a tight labor market. This resulted, here and there, in some pretty unhappy selections.

Many situations militate against the government's employment program besides a shortage of skilled help. Uncle Sam can-

not compete with industry on wages. Who will work for \$5,200 when industry offers \$8,000 plus many marginal financial benefits? Increasing government salaries is no answer; industry and the public would scream loud and long over increased pay-rolls. Nor can the government compete with industry on security.

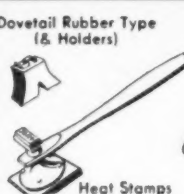
Let's face the facts: trained engineers and production men are not joining the government service. When the government unearths specialized workers, which happens constantly, industry too frequently pirates them.

True, the government with its peculiar *modus operandi*, makes it difficult for an independent, industry-trained specialist to function effectively. Too many government workers, especially in the military hierarchy, are permanent fixtures with no technical training and less industrial understanding, taking precedence and authority over the experienced civilian worker. No competent production man, if he can help it, will ever be told by a barber how to plan a production schedule. The government here has a situation which must be resolved.


But the changing plans and programs, trial and error methods, unrealistic and vague demands made by the military, all of which result in great chaos and confusion—make it mandatory that answers to the labor situation be found quickly. It is our government, and therefore, our problem as well.

*William F. Schleicher*


**Dovetail Rubber Type  
(& Holders)**




**Heat Stamps**




**Steel Type  
& Holders**



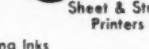
**Inspector's  
Hammers**



**(Rubber Type Holders)  
(Rocker Stamps)**




**Sheet & Strip  
Printers**




**Marking Inks**



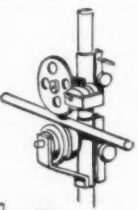
**Stamping Dies**



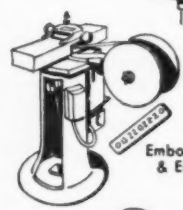
**Roller Dies**



**Bar & Tube  
Printers**




**Embossing Tags  
& Equipment**



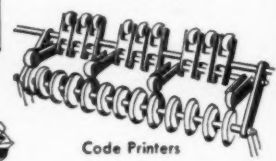
**Steel-Stamp**




**SEAMLESS**




**Stencils & Supplies**

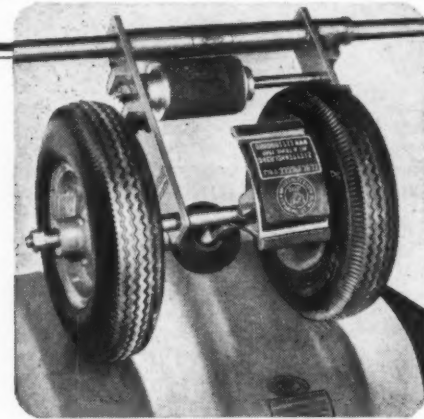


**Code Printers**



**Tool Post  
Roller Dies**






## PRINT COILED SHEETS AT PRODUCTION LINE SPEED

*and change printing die in 30 seconds!*

Maintain normal production *and* clearly mark sheet and strip for positive identification with this Pannier "Master Marker" Designed to mark coiled sheet, it can also print any flat material of any thickness, at a rate of 2,000 feet a minute. Pannier brass-backed vulcanized rubber dies, with interchangeable heat numbers, are securely held in slide engagement by a simple spring pin—can be easily changed in 30 seconds. Write today for complete data!

**OFFICES:**

• Chicago • Los Angeles • Youngstown • Philadelphia • Jacksonville •



## THE PANNIER CORPORATION

203 Pannier Building  
Pittsburgh 12, Pa.

# Featured IN THIS ISSUE

Thread rolling machine threads 18,000 pieces per hour.....	119
Machine tools displayed at European trade fairs .....	138
Special report on American gear making machines.....	163

Washington news letter, by Arnold Kruckman, Washington correspondent. Page 107

How's Business? Page .....113

**Planetary thread rolling machine threads 18,000 pieces per hour, by H. J. Hogue.** Some authentic production figures and data covering the operation of the Model No. 125 Prutton Rollmaster Planetary Thread Rolling Machine at the plant of Tru-Fit Screw Products Corp., Cleveland, Ohio. Page .....119

**Method of machining hard metals utilizes electrical energy, by John S. Roller.** This article describes the use and operation of a truly revolutionary metalworking machine. This process, known as Method X, is of interest to designers, metallurgists, engineers, tool makers, machine tool builders and manufacturers. Page .....127

**Development in European machine tools and accessories . . . as seen at recent trade fairs, by Paul Grodzinski, A.M.I. Mech. E.** A survey of the trade fairs held in 1951 at Hanover, Basel, Milan, Paris, Birmingham and Rotterdam by this well-known London authority on machine tools and accessories. Page .....138

**Special Report on Gear Making Machines.** The seventeenth in this popular series devoted to different types of American machine tools. The December report is in three parts: an article devoted to Shot Peening as a factor in the design of gears, descriptions of late model gear making machines of American manufacture; and tables of specifications of these and allied models described in the text. Page .....163

**Shot peening as a factor in the design of gears, by John C. Straub.** This article describes in detail the shot peening method

of gear hardening, indicating its use for increased strength, how it resists pitting and scoring. The survey is a condensation of a paper presented at a recent meeting of the American Society of Mechanical Engineers. Page .....163

**Chrome Carbides open new fields of application for metallic carbides .....**203

**It's easy to bend.** A description of the types of bending machines, as well as the special devices which are utilized to accomplish various bending operations. Product design and material selection appropriate for bending are also discussed. Page .....209

**How to improve your plant layout and the use of equipment . . . part 2, by Dr. Thomas G. Willson, consulting engineer.** This interesting series is a survey of the ideal production conditions which may be achieved through efficient plant layout. Specific factors and diagrams make this a "must" to plant maintenance men. Page .....223

**Available literature. Page .....**235

**Modern tools in action. Page .....**249

**Shop hints. Page .....**259

**News of the industry. Page .....**263

**What's new in metalworking. Page .....**275

**Mechanics through the ages. Page .....**370

**Product index. Page .....**372

**Index to advertisers. Page .....**378

# ROSS *Control* VALVES



THE BRIDLE FOR AIR HORSEPOWER

STANDARD  
OF THE INDUSTRY  
FOR OVER  
30 YEARS



**ROSS OPERATING VALVE COMPANY**

120 E. GOLDEN GATE AVE., DETROIT 3, MICHIGAN

by Arnold Kruckman

Washington Correspondent



Machine and tool industry's new prophet Swan Bergstrom, arrived in the glare of the synthetic sunlight of the General Accounting Office Building the day Washington celebrated the 459th anniversary of America's discovery. It's almost impossible to record how many prophets the machine and tool industry has had in NPA before Swan Bergstrom took over. They have come and they have gone. Bergstrom comes from the Cincinnati Milling Machine Company. Before he took title to the job as Director of NPA Metal Working Equipment Division he held an exclusive and hand-picked press "conference." He said auto plants were disappointing as machine tool stand-ins - except General Motors Fisher Body Division, which will make vertical boring mills. Swan says the rest of the automotive industry is not geared to get into machine tool production in a big way. He confided that his division will be ardently devoted to the job of developing machine tool contractors by going into the many diverse NPA Industry Advisory Committee meetings to find those in heavy industries capable of subcontracting for service in the machine tool program. Canning machine makers have 50,000 idle manhours a month for such subcontracts. Similar subcontracts are in process of negotiation with makers of graphic arts machinery. Hopes during next 6 - 8 months subcontracts will be undertaken by makers of printing machinery, textile machinery, packaging, food processing, paper and pulp machinery, and others. The new Director points out makers of heavy industrial machinery already have machine tools and highly skilled workers.

In his quarterly report to the President, ODM Wilson said: "In machine tool industry, demand is heavy for machinists and for operators of such machine tools as turret lathes, engine lathes and boring and milling machines." He said analysis now under way to identify individual machine tools that represent highest priority requirement, in order that machine tool builders may meet these needs first. According to Wilson, present machine tool employment in 350 plants in July was up 56% over July last year. By next July he expects it to be up to 50% more, to go to 90,000 production workers exclusive of sub-contractors. But he remarks the figure is still considerably below World War II peak of 123,000. He recites incident of manufacturer who placed order for 400 scarce tools. Finding delivery would put him seventeen months behind schedule he worked his total down to sixty which Government helped him to obtain. . . . With Wilson's blessing, they are seriously exploring artificial rain making to deluge the Pacific Northwest to provide power for aluminum production.

No fault of theirs has marked many starts on hopeful plans by the earnest folk in the machine tools section of Bergstrom's Division. It's hoped the trial and error fog of

NPA-DPA may be lifting. There is just a little uneasiness over the present sensible plan because the Department of Justice looks askance at almost any industry team-play. It knowingly permits no trade association official to have anything to do with anything NPA, DPA, OPS, ODM, ESA, DMPA, or with any of the four or five dozen alphabetically disorganized Government defense agencies. Every trade association representative is suspected of harboring the intent of organizing illegal collusion.

\* \* \*

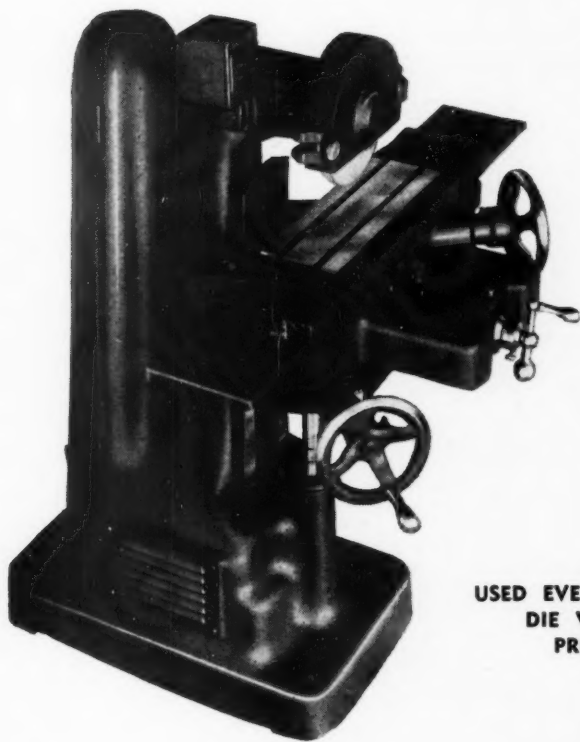
Air Force plans to spend, out of its new funds, \$980,000,000 on machine tools to reach its 1953 fiscal goal of 95 air wings. Budget Bureau is working on the program for further expansion to 140 wings. After Congress approves, Air Force will need still more machine tools. And there is already another program coming to a boil for which funds are available which means another \$980,000,000 for machine tools. . . . Machine tool plans are submitted to Air Force Procurement, with complete layout and schedule, showing types and numbers of tools. Official Air Force clearance is required. Air Force either pays on delivery, or charges off the item as producers make their own deliveries. . . . Air Force emphasizes new jets, and still newer jets to come, require more tools - tools entirely new in design.

Army will spend \$202,000,000 on machine tools. Navy has \$101,273,000 to spend. This makes the almost incredible total of \$2,263,273,000 waiting to be spent on machine tools. . . . The 85,000 tools stored at Omaha and Marietta, Ga., have been picked over, so only 5,000 remain. Most of those left need reconditioning; some are merely scrap. . . . To quicken subcontracting, Air Force has teams everywhere showing smaller people how to subcontract to supply hundred different small parts, gadgets for tools. . . . It is expected new tools, improved models, swiftly will scrap old ones. . . . Machine tool shops, Government acknowledges, required to do 75% defense work, many doing 85%, have almost nothing left for many long-standing civilian customers' orders. They tell you here in 3 - 4 years nondefense shipments may comprise 50% to 70% of total business.

\* \* \*

Canada, in past, using British-type weapons, had tools, dies, lathes, milling machines, geared to British-type equipment. Secretary of Commerce Sawyer recently said Canada now has changed to U.S.-type equipment, and will replace its machine tools, geared to U. S. style. He made clear all NATO nations will change over to our gearing since they use our equipment. . . . Government is to bring back from Europe, fast as possible, American-made tools in European plants. . . . Government is active in rounding up used machine tools in plants which can't convert to defense work. . . . Machine tool makers, eligible for V loans, are urged and implored by officials of General Services Administration not to write to them in Washington but to go directly to their banks. Banks are fully familiar with V loans, can supply blanks and details, and will handle expeditiously. GSA, here, has been swamped by floods of letters. . . . Machine tool industry expected to be free largely of excess profits tax penalty by use of exemptions for depressed industries.

# THE **COVEL** 6 X 18 **NO.** SURFACE GRINDER **15**



WITH NEW  
OUTSTANDING  
FEATURES



**HARDENED  
AND  
GROUND  
KNEE WAYS**



**HARDENED  
AND  
GROUND THREAD  
LEAD SCREWS**



**HARD CHROME  
TABLE WAYS**

USED EVERYWHERE FOR TOOL &  
DIE WORK AND SMALL  
PRODUCTION RUNS

WRITE FOR  
BULLETIN  
MT 121

## **COVEL**

BUILDERS of PRECISION GRINDERS FOR 77 YEARS  
**PRECISION GRINDERS**  
**BENTON HARBOR, MICHIGAN**

WBS Special Panel report and recommendation in tool and die wage survey recently published thought here to upset all wage stabilization patterns. Maximum rates go far beyond what leading employers pay in principal areas. Panel recommended in Detroit, \$2.35 an hour for job shop; \$2.60, in captive shop, maintained by auto and rubber plants - latter is 50¢ above current rate. In Chicago maximum rate, \$2.60 - \$2.75; in Indianapolis - tight labor area - \$2.55 for job shop; \$2.45, captive. . . . Off record, WSB folk expect Unions everywhere will demand highest rates, obviously feeling justified by the 25¢ to 50¢ increase recommended. Electricians, carpenters, plumbers, known to have determined to follow the trend. Semi-skilled workers, and others unskilled, will inevitably ask their wages to be brought into line, many on the principle that it is appropriate to eliminate intra-plant inequities. Pointed out here the recommendations closely follow War Labor Board pattern of last war. WLB always tried to anticipate Union demands without submitting policies to bargaining in industry conferences. . . . Note: Unions trying to avoid appearance of nation-wide strikes, in order not to tangle with defense bothers, by making current strikes local or on company basis. This deflects board comment. Employers who fight are ruthlessly slaughtered. . . . Steel workers are now entitled to 4¢ an hour raise, added to present \$1.71 per hour; but they want at least 10¢ an hour more. Murray expected to make demand mid-November, and to force decision by New Year. Higher wages obviously will mean higher prices. Anticipated steel and tool and die wage business will force up entire price and wage structure. Don't expect relief through WSB. It's a worse mess every day.

\* \* \*

Copper-Zinc-Lead Committee of the International Materials Conference, known as IMC - consisting of 32 nations, agreed on distribution of copper, zinc, lead for October, November, December. The demand was for 100,000 metric tons more than available. Chile will distribute 80% of its copper products as planned; 20% as it pleases. Nations will buy from usual sources, and each Government will police its own nationals. Countries participating included practically every nation in Europe not behind the Iron Curtain, as well as South America, North America, Asia, Africa, and Australia. We get biggest bite of copper, 333,770 metric tons; and, biggest bite zinc, 228,860 tons. U. K. comes nearest to us with 91,690 tons copper, and 60,250 tons zinc. Total copper available for distribution was 677,080 tons copper; 469,260 tons zinc. . . .

\* \* \*

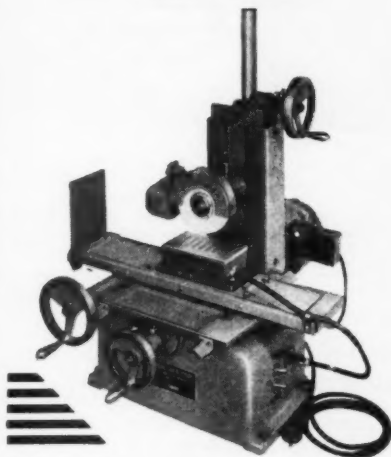
Some mills have only 2 days supply of scrap on hand, some even less. DEPA urges obsolete machinery now stored, also copper, bronze, brass, aluminum and lead scrap be turned over to the scrap dealer as fast as possible. Urges that small quantities be turned in immediately. Requests top level executives to accept personal responsibility for operating the scrap drive. In cooperation with Edwin C. Barringer, Executive Vice President, Institute for Iron and Steel Scrap, committee of Government officials animate the scrap campaign.

# SANFORD

## SURFACE GRINDER

MODEL SG

**DOES  
YOUR  
SMALL  
WORK**



The capacity of this sensitive accurate, Bench Model is 4" transverse—8" longitudinal—6" vertical under 4" Wheel.

Meehanite Castings and very sturdy construction assure long life, vibrationless operation and finishes to micro-inches.

Attachments for WET grinding are available.

Write for complete details.

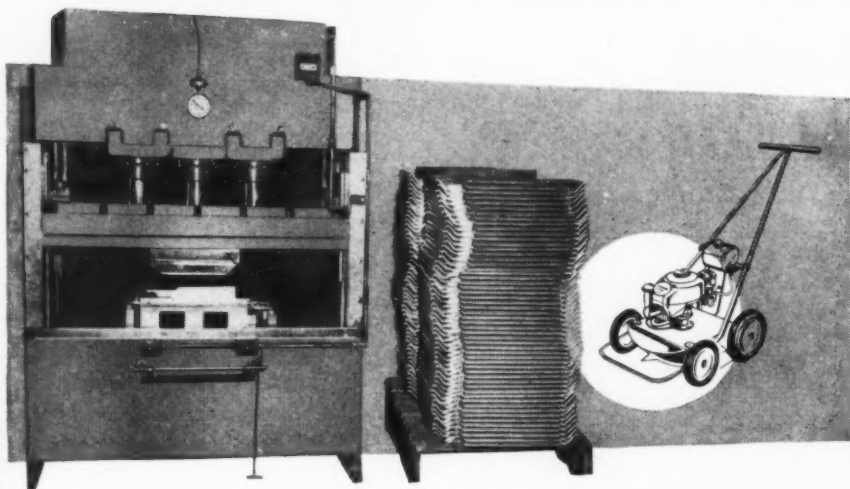
**SANFORD** **MANUFACTURING CORP.**  
1026 Commerce Ave., Union, N. J.

**WORTHINGTON MOWER**

**trims costs by forming**

**deck plate frames in one operation**

**on K-R-WILSON press . . . . .**



The KRW 150 ton 3-cylinder hydraulic press, shown above, is set up to form *in one operation* the aluminum deck plate frames for Worthington's popular 18" Rotary Mower. The press is also used for forming sheet metal parts on larger Worthington Models 48 and 62. Officials of the company tell us "this press has been in constant use for nearly three years, both day and night shifts, on the blanking, piercing and forming of many of the larger parts going into our line of mowing equipment". There's proof of the versatility and rugged service you get with KRW Hydraulic presses.

Need hydraulic presses in your business? KRW has a full line available for *immediate delivery* in 25-150 ton capacities; one, two and three cylinder types; either hand operated, air operated or motor driven. You'll find that KRW hydraulic presses are the lowest priced on the market . . . and they do the Biggest day's work!

**K R WILSON**

215 MAIN ST.

BUFFALO 3, N. Y.

Ask your Machinery dealer to quote prices or write or wire Dep't 13

# How's BUSINESS?

## General business indicators

source: Dept. of Commerce

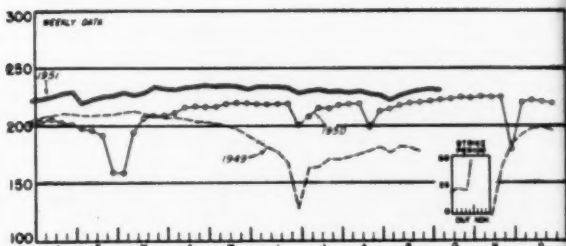
### New machine tool report filing date

Machine tool manufacturers will be given until November 15, 1951, to file reports required under the recently revised machine tool regulation (CPR 30, SR 2, Rev. 1), the Office of Price Stabilization announced today.

As originally issued, Section 8 of Supplementary Regulation 2, Revision 1, to Ceiling Price Regulation 30 (Machinery), provided that reports on OPS Public Form 8, as required by Section 44 of CPR 30, should be filed by October 15, 1951. This date has now been extended to November 15, 1951.

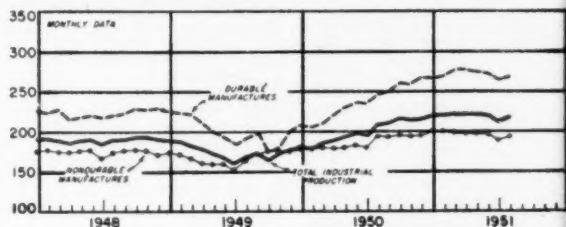
It was found that many manufacturers will require additional time in which to complete and file the required reports. Detailed instructions to be used by machine tool manufacturers for completing Public Form 8 under amended provisions of CPR 30 were only recently issued by OPS. Most manufacturers have not had these instructions for a sufficient period to use them in completing their filing by October 15,

### Steel ingot production (1935-39=100)



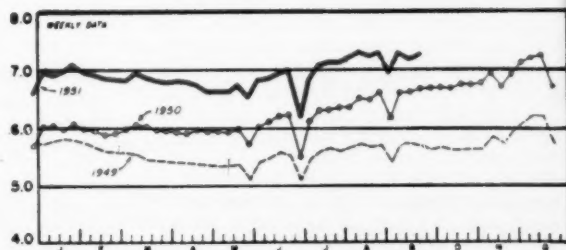
### Industrial production

(Seasonally adjusted, 1935-39=100)



### Electric power production by utilities

(Billions of kilowatt-hours)



1951, the original filing date.

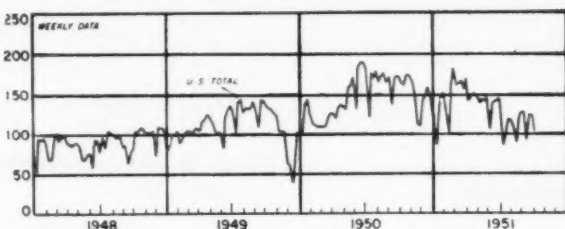
The extension will be covered by Amendment 1 to Supplementary Regulation 2, Revision 1, under Ceiling Price Regulation 30 (Machinery).

## Copper

Thirty thousand tons copper was released for industry by Truman at the request of Wilson from the national stockpile. With the 25,000 tons released earlier, this depletes the stockpile 55,000 tons as result of strikes here and long-shoremen strikes in Chile . . . Hundred thousand pounds copper per year is salvaged from projection arc lamps in 20,000 motion picture theaters. The flash-in-pan drops 94% copper . . . Phelps-Dodge Corporation gets \$25 million backing from DMPA to step up copper production at Bisbee, Ariz. This will add 38,000 tons a year by 1954-55. Government buys 150,000 tons for 22c a pound . . . ODM Wilson says new copper ore bodies ready for development in Nevada, Ariz., South America, and Alaska. Incentives are necessary to stimulate exploration and development. The 215,000 annual tons now ready for production will not be available for two or three years . . . DMPA has agreed to buy 170 million pounds copper from the Copper Cities Mining Company which is operating near Miami, Ariz. DMPA has supplied \$15,200,000 for expansion. Production is expected October, 1954 . . . Government advanced \$60,000 for expansion of the North Butte Mining Co., in Montana, which

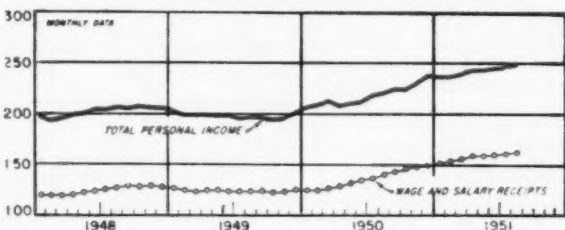
## Motor vehicle production (passenger cars and trucks)

(Thousands of vehicles)



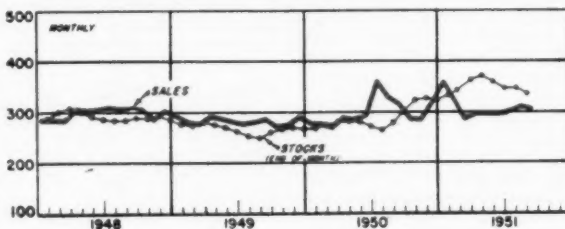
## Personal income

(Billions of dollars, seasonally adjusted, at annual rates)



## Department store sales and stocks

(Seasonally adjusted, 1935-39=100)



will produce yearly 7 million pounds of cement copper. DMPA will purchase at 24½c a pound.

## Military needs

Military needs of supply first quarter are carbon steel, 156%; stainless steel, 170%; copper, 166%; brass, 175%; aluminum 177% . . . CPR-80 establishes ceiling for used machine tools and used machine tool extras, heretofore under GCPR. Ceilings are fixed by applying stated percentages based on age and condition of

# Pantography at Work



Inside profiling operation produces more than 36 pieces per hour with Gorton Tracer Control. Approximate time by the next best method . . . one piece every two hours.

## GORTON

- IMPROVES QUALITY
- INCREASES PRODUCTION • CUTS COSTS

On many all-but-impossible jobs, Gorton Tracer-Controlled Pantographs and Duplicators speed up production on military or industrial contracts. High surface finish results from spindle speeds up to 45,000 R.P.M. Accuracy results from the use of over-size masters, patterns, or templates together with the reduction ratio which is exclusively characteristic of the pantograph. Whether a dozen or a thousand pieces, each is identical to the first. Work piece size varies from instrument parts to areas of 10 to 20 feet.

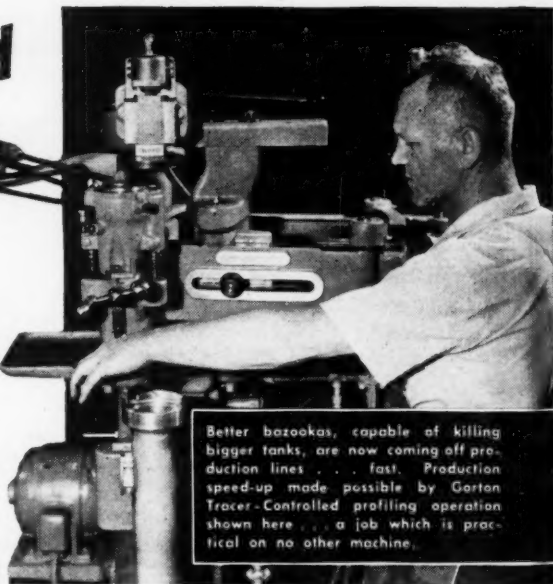
Gorton tracer-controlled equipment quickly pays for itself in profiling, routing, die sinking, mold cutting, counterboring, chamfering, grooving, graduating, engraving as well as many other standard or special operations on ferrous or non-ferrous metals and plastics where work is flat, uniformly curved, cylindrical, spherical or irregular in shape.

Mail the coupon below for General Catalog illustrating the complete Gorton line.

**GEORGE  
GORTON  
MACHINE CO.**



1412 Racine St., Racine, Wis., U.S.A.



Better bazookas, capable of killing bigger tanks, are now coming off production lines . . . fast. Production speed-up made possible by Gorton Tracer-Controlled profiling operation shown here . . . a job which is practical on no other machine.

### PRODUCTION DATA—

**JOB:** Profile 6 locking lugs for male and female sections of new 3.5" Bazooka

**MATERIAL:** Aluminum alloy  
**CUTTER:** 5/32" dia. single flute, fast spiral H.S. steel running at 3,900 R.P.M., without coolant

**MASTER:** 2 masters: one for male and one for female sections; 3 times oversize, traced manually

**HOLDING FIXTURE:** Pneumatic-operated internal expanding type

**APPROX. TIME:** 36 pieces per hour

**ALTERNATE METHODS:** None practical

Please send at once complete information about the Gorton line contained in Bulletin 1655-1412.

Firm .....

Name .....

Title .....

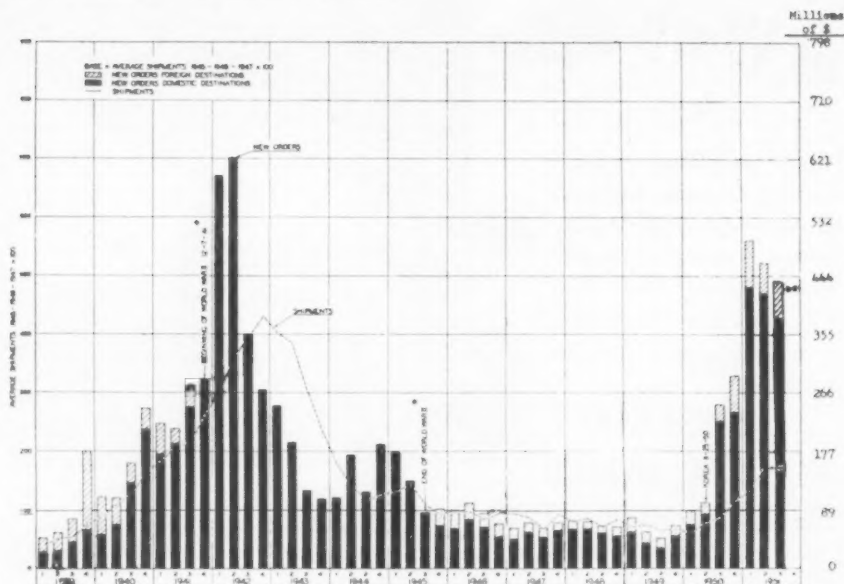
Address .....

City, State .....

P3554-R

## Machine tools: dollar value of new orders and shipments, quarterly, 1939- 51

National Machine Tool Builders Association



used machines, as of January 25, 1951; of comparable price for new machines. The regulation largely is based on recommendations by the UMTI Advisory Committee. The prices are established at about the same level as established in GCPR. The order describes details how to determine age of machine and prescribes percentage to be used according to arbitrary age limits and conditions.

The applicable markdown percentages for pricing used machine tools and extras are applied to 3 categories in 5 age brackets as follows:

Manufactured after January 1, 1948
Manufactured after January 1, 1936
Manufactured after January 1, 1928
Manufactured after January 1, 1922
Manufactured after January 1, 1916
Manufactured before January 1, 1916

### New sources for gas, oil

In a report issued by the Department of Interior several new sources for gas and oil are discussed. The reports cite the oil and gas possibilities of northwestern Wyoming shed new light on development of the oil shale resources of Colorado and announce a lease offering of 280 acres of Wyoming oil lands.

In pointing out possible new petroleum sources, the Geological survey reports rich oil-shale deposits accessible for development in Garfield County, Colo., called one of the most favorable areas for an oil-shale industry in the U. S.

"Rebuilt and guaranteed"	"Reconditioned"	"As is"
95%	85%	75%
90%	75%	60%
85%	70%	50%
70%	50%	30%
60%	40%	20%
50%	30%	15%



This new Putnam two flute keyway end mill is designed especially to solve your tolerance problems in keyway milling. Each size is available in three compensating limits: for instance, the  $\frac{1}{2}$ " mill is made in .499", .498" and .497" diameters, each with  $+.001"$  —  $.000"$  tolerance.

For full facts on this or any of the 1000 Putnam end mills, write for Catalog No. 52 on your letterhead.



**PUTNAM**

2981 CHARLEVOIX AVENUE • DETROIT 7, MICHIGAN



## Using Unfamiliar Alloys?

# Here's How to Remove THE RISK



Today, when Government restrictions are enforcing the use of leaner alloys with unfamiliar heat treatment response, you'll find Ryerson Alloy Service more helpful than ever. The tests we make to assure quality, verify analysis and guide your heat treating are your best protection against costly production errors.

For example, we put every heat of Ryerson Alloy through four separate hardenability tests. The result: Positive knowledge of the hardenability of every shipment of Ryerson alloy. These tests enable you to buy on the basis of harden-

ability, in addition to analysis — *the only really safe way to buy alloys under today's conditions.* All test information — hardenability, analysis, etc. — is carefully recorded on a Ryerson Alloy Certificate which is delivered with your steel as a guide to heat treatment.

Don't take today's alloys for granted. Order by hardenability from Ryerson and be doubly sure. Some shortages are inevitable, but, as always, we'll do everything possible to meet your requirements. So, for any steel need, phone the Ryerson plant nearest you.

## RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT  
CINCINNATI • CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS  
LOS ANGELES • SAN FRANCISCO

## Planetary thread rolling machine threads 18,000 pieces per hour

THE INTRODUCTION of planetary thread rolling machinery nearly two years ago has caused a great deal of comment in the Fastener Industry. This comment has varied from enthusiastic reports of almost unbelievably high production to serious doubt that anything but the most crude thread would ever be rolled by machines based on the planetary principle.

Approximately a year and a half ago we purchased one of the first Model No. 125 Rollmaster Planetary Thread Rolling Machines, manufactured by the D. H. Prutton Company of Cleveland. Our experiences with this machine may be of interest to the threading industry.

We have used this machine to thread screw sizes No. 8, No. 10, and  $\frac{1}{4}$ " to  $1\frac{1}{2}$ " long and roll practically the entire production of one  $\frac{3}{16}$ " and one  $\frac{5}{16}$ " Waterbury-Farrel Hi-Pro Headers. Of the nearly ninety million screws produced on this machine thus far, we have not had one complaint or rejection from our customers.

### Production and die life

Our daily production averages 350,000 pieces for two shifts totaling nineteen hours or approximately 18,000 per hour, figure 1. This production includes set-

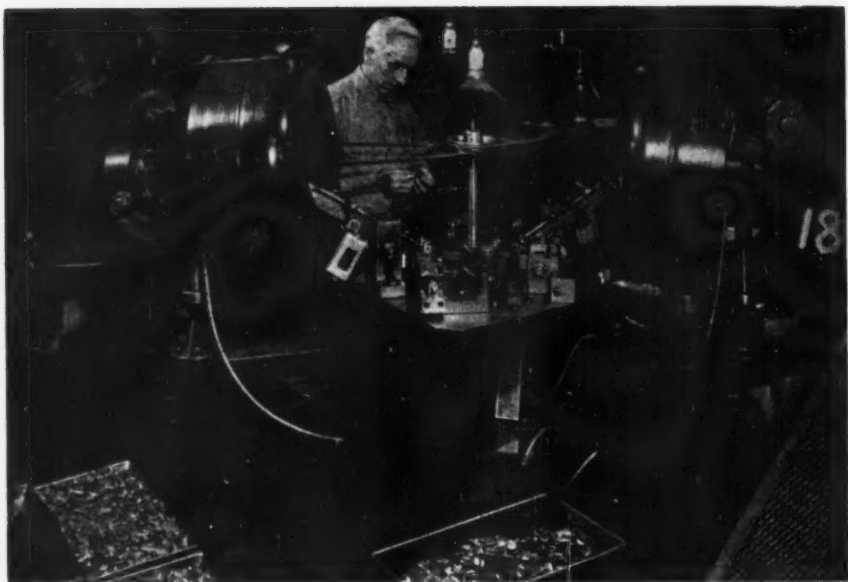
by H. J. Hogue

President

Tru-Fit Screw Products Corp.

up, adjustments, downtime, etc. The highest rate we have attained is 21,900 per hour for one ten hour period.

One of the most surprising things about this machine has been the die life attained. Our production on this machine, almost entirely C-1010 and C-1018 steel, has been from three to five million pieces per set of dies, figure 2. We did have one set which produced over six million. An interesting comparison covering die costs of reciprocating and planetary thread rollers has been made, showing cost figures of  $1\frac{1}{2}$  cents per thousand for the reciprocating machines and  $2\frac{1}{2}$  cents per thousand on the planetary machine. Although this indicated nearly 70% higher die costs per thousand pieces produced, the much



**1. The Rollmaster planetary thread rolling machine . . .** turns out 18,000 pieces per hour at the Tru-Fit Screw Products Corp. Daily production averages 350,000 pieces for two shifts totaling 19 hours.

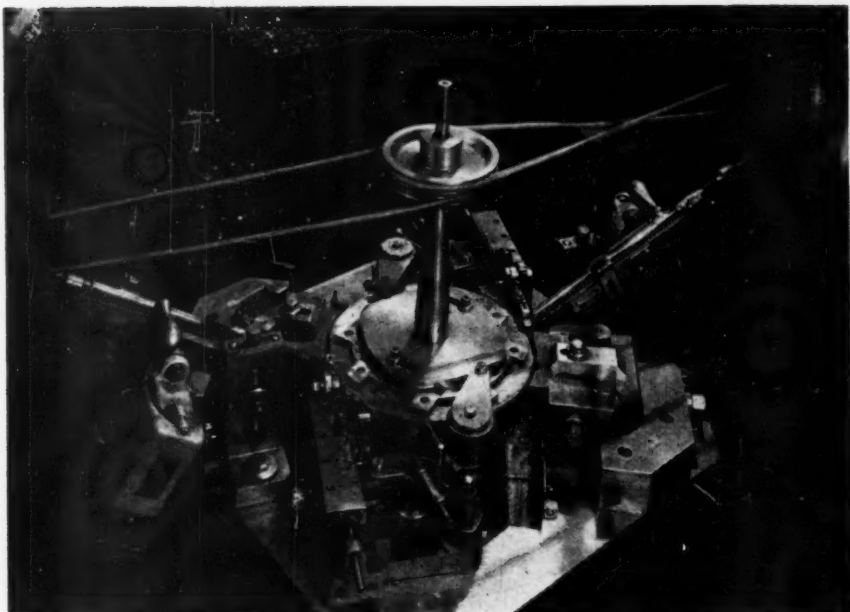
greater speed of the machine and savings in floor space far outweighs this increase in die costs.

Based on comparative production performances, the Rollmaster machine occupies only one third the floor space required by a group of reciprocating machines yielding the same total production. We have calculated that the planetary machine offers a 65% savings in man hours per thousand threaded parts.

### **Threading principle**

The Rollmaster machine utilizes the same actual threading principles used in all production thread rolling machines, however, in the application of the planetary principle to thread rolling, it has been necessary to apply

some of these principles differently. The most notable departure is in the rigidity of the thread rolling dies. Having eliminated deflection, or "spring" of the dies in the design of planetary machines, the manufacturer recommends setting the finish end of the planetary dies to the exact diameters of the thread required. The start end of the stationary dies is set in a more open position to allow easy entrance of the work between the dies. This slight cocking of the stationary dies also permits a gradual penetration of the dies into the work during the rolling process, allowing sufficient time for the displaced metal to flow naturally. The effectiveness of this setup method is reflected in the extremely high die life experienced with standard low carbon-high chrome die steel.



2. Close-up of the die used in Tru-Fit's planetary thread rolling operation. Note the two rotary hopper feeders designed to feed as many as 20,000 small parts per hour.

### **Difference between planetary and reciprocating thread rolling**

In a reciprocating machine a blank is fed between a stationary and a moving die. The threading operation is completed when the moving die completely passes the stationary die. The moving die completely passes the stationary die, stops, reverses, and passes the stationary die empty. Total production per cycle is one threaded part.

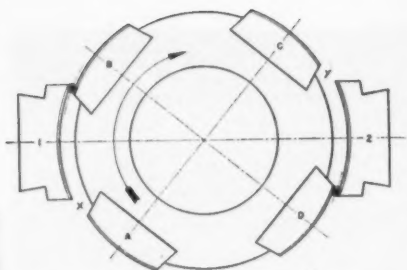
### **Principle of planetary thread rolling**

Figure 3 shows the principle of the planetary method of thread rolling which produces eight threaded parts

per cycle. The machine illustrated is model 125 Rollmaster.

Rotary dies A, B, C, and D are inserted in a rotary die holder attached to the main spindle of the machine. Stationary dies 1 and 2 are diametrically opposed across the center of these dies. The cycle begins when rotary die A, moving in a clockwise direction, approaches stationary die 1, figure 4.

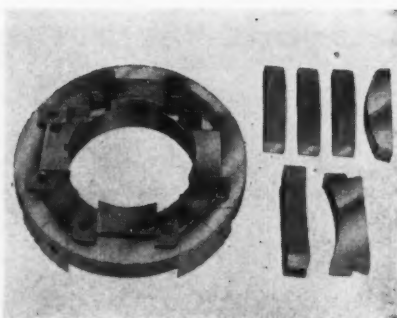
As rotary dies are placed 90 degrees apart, exactly the same situation exists as stationary die 2, where rotary die C is approaching in the same relative position. As die A reaches die 1, one blank is inserted between them at X while another blank is inserted between dies C and 2 at Y. In 90 degrees of travel from this point, dies A and C will clear



3. A schematic diagram of the principle underlying the operation of the Rollmaster thread rolling principle. Note the two stationary dies, 1 and 2, and the four segmented, or moving, dies, A, B, C, and D.



4. Illustrating the dies and work passing through. In planetary thread rolling four segmented and two stationary dies are used.



5. A set of dies used in planetary thread rolling

dies 1 and 2, ejecting two finished threads. Dies B and D are in starting position on dies 1 and 2 respectively, with blanks being inserted between them again at X and Y.

Another 90 degrees of rotation ejects these two pieces and brings dies C and A to starting positions on dies 1 and 2 respectively, with blanks again inserted at X and Y.

In the third 90 degrees of travel, two or more pieces are ejected and dies D and B are in starting positions at dies 1 and 2, and blanks are again fed in at X and Y, figure 5.

The last 90 degrees turn ejects these two pieces and brings dies A and C back to their original starting positions on dies 1 and 2 to complete the production cycle. Total production is eight threaded parts.

**The End.**



## INTERNAL THREADING AND BORING TOOLS

For holes from 1/8" upwards, 15 different sizes. The accurate thread angle is maintained through each sharpening until tool is entirely worn down. Small head-long cutting surface for regrinding.

**COMET TOOL CO.**  
738 B'way., New York 3, N. Y.

*Write for  
Complete  
Data.*



# di-acro PUNCH



**NEW  
DOUBLE  
PURPOSE  
PRESS**

Available in two sizes,  
6" and 12" throat depth

Now you can punch holes of various shapes as large as 4" diameter in 16 gauge steel—also blank, draw, emboss, form—all with the new DI-ACRO Punch. It is ideal for both experimental and production work.

The precision ground triangular ram of this double purpose press prevents punch head from turning, assuring perfect alignment at all times.

A Turret Stripper of exclusive DI-ACRO design automatically strips material from punches of all shapes. Roller Bearing cam action develops 4-ton pressure with minimum effort. Adjustable gauges assure exact location of holes.

## Send for "DIE-LESS DUPLICATING" Catalog

Gives the full story of the DI-ACRO Punch, and also DI-ACRO Benders, Brakes, Shears, Rod Parters, Notchers, as well as the new DI-ACRO Vari-O-Speed Powershear and Hydra-Power Bender.



NOTCHERS



PUNCHES



BENDERS



BRAKES



ROLLERS



SHEARS



ROD PARTERS

**O'NEIL-IRWIN**

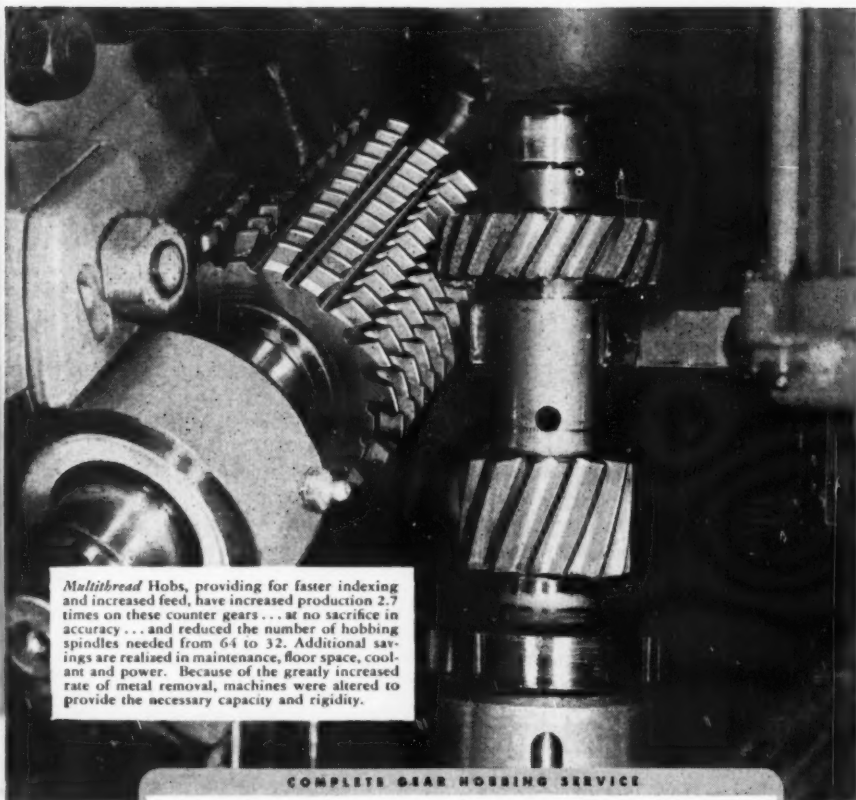
314 8th AVE.  
LAKE CITY, MINN.



# Barber-Colman

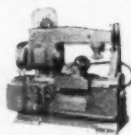
## *Multithread Hobs*

TRIM GEAR CUTTING COSTS

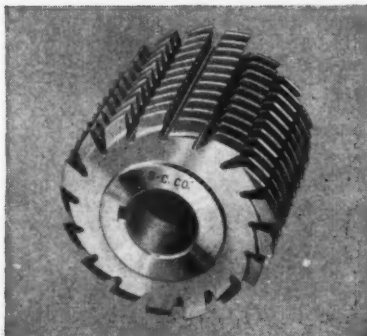


*Multithread Hobs, providing for faster indexing and increased feed, have increased production 2.7 times on these counter gears ... at no sacrifice in accuracy ... and reduced the number of hobbing spindles needed from 64 to 32. Additional savings are realized in maintenance, floor space, coolant and power. Because of the greatly increased rate of metal removal, machines were altered to provide the necessary capacity and rigidity.*

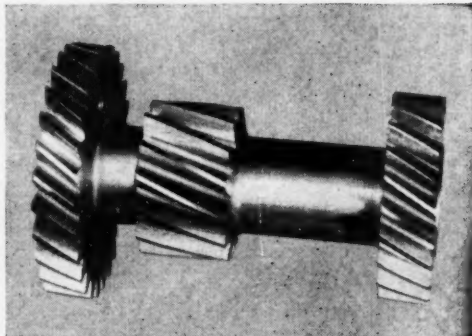
COMPLETE GEAR HOBGING SERVICE



HOBBS • MACHINES • SHARPENING • TECHNICAL DATA



▲ These 4" x 4" Multithread hobs have more gashes for finer finish. A taper hole eliminates runout, holding the pitch line of the cut gears to maximum concentricity. Precision spacing of 3 leads produces involute and tooth spacing to preshelve limits.

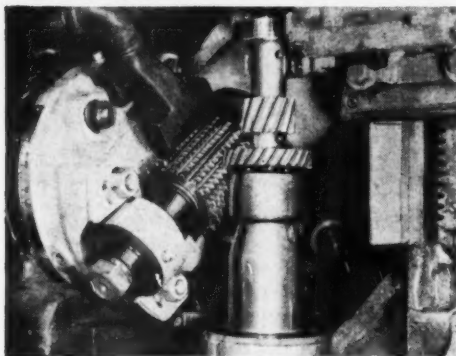


▲ These 27 and 22-tooth 9.25 pitch gears (for passenger car and truck transmissions) are forged from AISI 5145 or 8620-H steel. Multithread hobs have cut costs per gear to slightly over 1/3 former average. Lead errors are held within .0005". Production per hour has been increased from 26 to 82 gears (net, at 85% efficiency).

**Automotive Plant Pioneers New Hob Application with Barber-Colman Hob Engineers. Disregards Conventional Hob Design to Almost Triple Production. Cuts Costs to 1/3 Previous Average.**

▼ The 27-tooth gear on the counter gear is hobbled at 156 rpm and .062" feed. Previous feed was .053". Face width is 3/8". Cutting time per gear has been reduced from 6.55 to 2.2 minutes. Remarkable savings are possible because of increased feed and faster indexing with Multithreads.

The 22-tooth gear on the counter gear is hobbled at 156 rpm and .052" feed. Cutting time is 2.16 minutes. Single-thread ground hobs formerly cut at .043" feed. Hobbing time averaged 6.13 minutes per gear.



Multithread Hobs are a development by Barber-Colman engineers, providing faster indexing in the hobbing of gears. Instead of the usual single lead, Multithreads have several threads, and have produced unusual production increases on gear cutting jobs requiring very high rates of output.

As a result of production gains possible with hobs of this design, a fewer number of hobbing machines are required to complement the finish shaving and grinding equipment.

Multithreads are recommended only on the basis of comprehensive analysis of the job factors in individual plants. Therefore, we suggest that you ask a Barber-Colman Representative to call.

Write for additional information about the production increases possible with Multithread Hobs.

# Barber-Colman Company

GENERAL OFFICES AND PLANT, 812 ROCK STREET, ROCKFORD, ILLINOIS, U.S.A.

BUILDERS OF PRECISION GEAR HOBBS AND MACHINES SINCE 1911



**Customers greet you like this ?**

**Let us try to help you...**Sometimes we can relieve the pressure of customer's demands by suggesting alternate material or production changes which will help you get more use from the steel you use. Whatever your steel problem may be, why not put it up to United States Steel Supply?

## **UNITED STATES STEEL SUPPLY COMPANY**

*Warehouses Coast to Coast*



BALTIMORE • BOSTON • CHICAGO • CLEVELAND • LOS ANGELES • MILWAUKEE • MOLINE, ILL. • NEWARK  
PITTSBURGH • PORTLAND, ORE. • ST. LOUIS • TWIN CITY (ST. PAUL) • SAN FRANCISCO • SEATTLE

Sales Offices: INDIANAPOLIS • KANSAS CITY, MO. • PHILADELPHIA • PHOENIX  
ROCKFORD, ILL. • SALT LAKE CITY • TOLEDO • TULSA • YOUNGSTOWN

Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

**UNITED STATES STEEL**

## Method of machining hard metals utilizes electrical energy

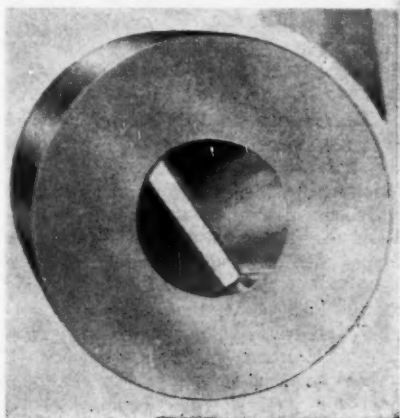
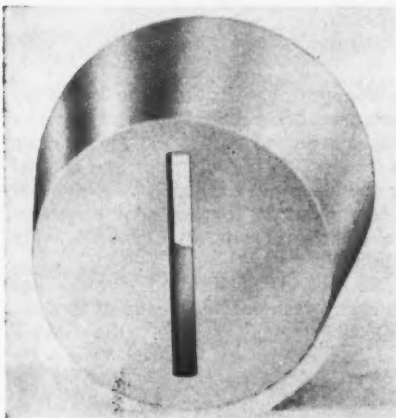
by John S. Roller  
General Manager  
The Method X Company

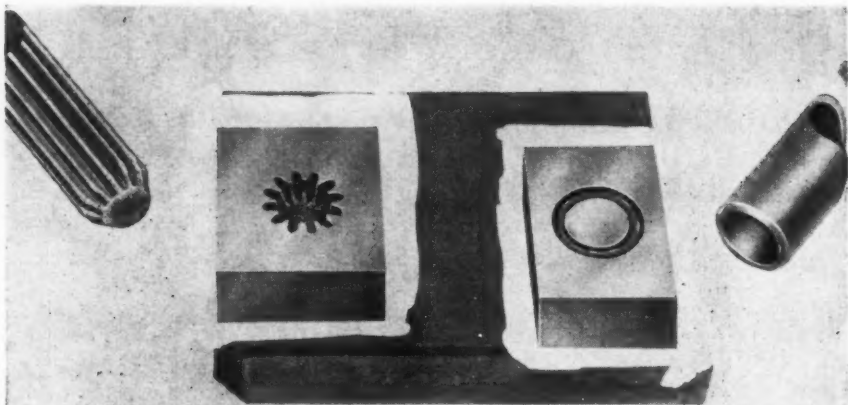
A COMPLETELY new method of metal removal which employs the direct utilization of electrical energy for the machining of any electrically conductive material has been developed and made available to the metal working industry. The Method X machine removes metal in a directed manner by means of an electric spark discharge which does not otherwise affect the work material's physical or chemical

characteristics. The process is made available through the Method X Corporation of Philadelphia, an affiliate of the Firth Sterling Steel & Carbide Corporation.

The machining action depends on a mechanical, not thermal, effect of electricity which sets up internal mechanical stresses by the use of extremely high current densities and thereby cause the metal particles to detach

1. This compound radial-rectangular internal shape . . . is typical of the capability of the machine. The product is a water descaler nozzle shopped from a solid section of carbide.





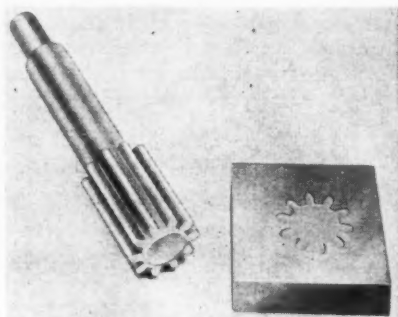
**2 and 3. Gear and ring compacting die sections . . .** produced directly in solid, sintered carbide. The punch for the gear section can also be machined in sintered carbide by using a shaped electrode as a cutting tool and shaping the splines in the conventional manner on the Method-X machine. (The gear-shaped electrode is made of brass.)

themselves from the work material without resort to melting. The exposed surfaces thus remain unchanged and surface finishes of 26 micro inches rms can be obtained. Lapping of less than 0.001" will produce any desired finish down to 0.15 micro inches on sintered carbide. Center to center spacing of holes through the same workpiece can be controlled to approximately 0.0005". Blind hole file radii can be made as small as 0.002".

#### **Application hard-to-machine metals**

The fabrication difficulties of sintered carbides, superalloys, S-816, Vitalium and hardened steels has somewhat restricted their uses. Now, the Method X process not only can be used to machine the conventional machining shapes but extend the uses of these hard-to-machine metals by forming complicated geometric shapes economically and rapidly which are not practical with other machining methods.

An example of this is the material used for gas turbine blading. Blade



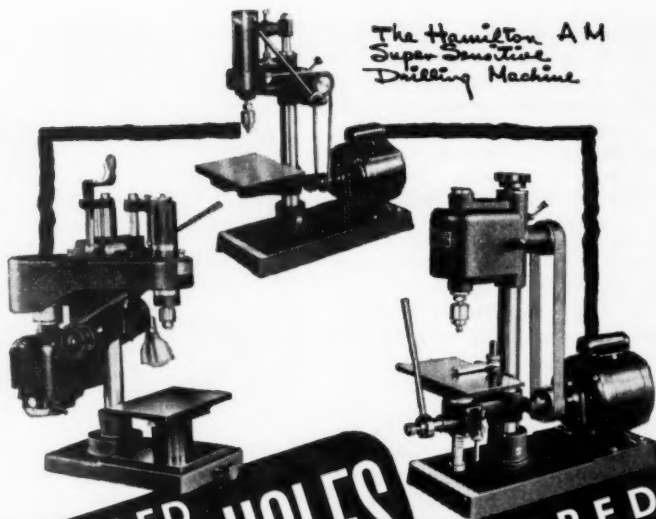
root mounting serrations are being laboriously ground for the intricate shapes required and to extremely close tolerances. Blade sections are shaped by show contour milling, precision casting or hammer forging. All processes are relatively slow and comparatively expensive.

Die sections of sintered carbides are generally fastened by means of threaded steel sections brazed into the carbide and secured to the backing blocks by screws. Another means of fastening die sections is to shape, drill and tap wedges

*The Hamilton Variomatic®  
Super Sensitive Variable Speed  
Drilling Machine*

*The Hamilton A M  
Super Sensitive  
Drilling Machine*

*The Hamilton Super Sensitive  
Tapping Machine*



DRILLED

HOLES

TAPPED

## *Hamilton* DRILLS AND TAPPERS

**MAKE TIME • SAVE COSTS  
ON ACCURATE SMALL HOLE PRODUCTION**

Small holes . . . tiny holes . . . in materials of such diverse characteristics as fiber and monel, ceramic and bronze, are being

drilled and threaded speedily, accurately, profitably . . . NOW . . . by thousands of Hamilton Drills and Tappers.

*The Hamilton* VARIMATIC® DRILL,

*The Hamilton* A-M DRILL,

*The Hamilton* TAPPER,

each a bench type, super-sensitive machine with ample clearances and travel, incorporate such precision that work is always held well within the tolerance allowed, and such stamina that they maintain their accu-

racy year after year even under heavy production loads. Our free Bulletin No. V-472 provides full information including specifications. Write now! Tomorrow you may need the information.



THE

*Hamilton* TOOL  
COMPANY

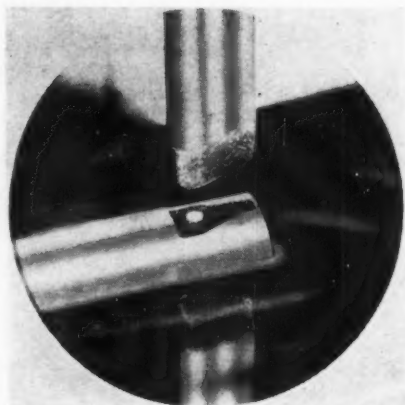
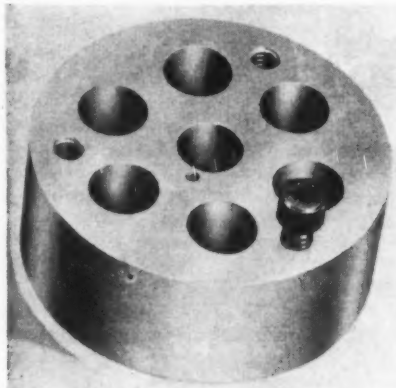
826 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

to fix the carbide die sections to backing blocks. Both methods are slow and costly and not entirely satisfactory since either type leaves the mountings subject to loosening due to shocks encountered in service. Brazes may fail or wedges may work loose. In either case, failure of expensively fabricated die sections may result.

Metallurgical research experiments and tests require holes or slices cut in superalloys, high temperature carbides and ultra hardened steels without destroying or changing the exposed surfaces either physically or chemically.

The application of Method X to all these problems is one answer. Gas turbine blade contours and root serrations can be readily shaped with Method X. Hardness has no effect on machinery speed. Sintered carbide die sections can be bored and tapped so that direct fastening to the backing blocks with machine screws can be accomplished. Complicated geometric shapes can be shaped directly into the hardest of metals. See figures 1, 2, and 3.

**4. A compacting die section . . . of solid carbide with 3 machine-screw holes. The machining was done entirely after final sintering of the carbide.**



**5. Metal removal is the mechanical, not thermal, effect of electricity on the material being shaped.** Particles detach themselves without melting, leaving the exposed surface unchanged physically or chemically. The metal removal is accomplished rapidly and accurately.

The problem of warpage encountered in heat treating steel dies composed of symmetrical hole shapes such as for cookie dies for electrical stator laminations can be eliminated completely by first heat treating the solid steel section then machining the desired shapes by this method. Sintered carbides undergo a shrinkage of 15 to 20% which is not uniform in all directions and it is therefore, often impractical to form several hole shapes in the half-sintered carbide and then expect hole centers within close measurements. By utilizing the new method, simple geometric shapes can be produced as hardened pieces and then accurate machining of the desired holes can be done rapidly and accurately. Much of the laborious grinding and lapping time usually associated with sectional dies can be eliminated; threaded fastening holes and work sections, no matter how complicated, can be machined in the hardest and toughest of carbides, figure 4.



## SENSITIVE UNIVERSAL BENCH RADIAL DRILL PRESS

**Drills at ANY angle  
or position of arm**

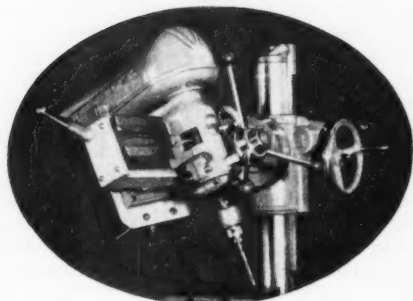
For drilling, tapping, light profiling.

1/2" capacity; 1/3 h.p. motor; 4 speeds: 840, 1200, 2400, 3600 r.p.m.; weight, 440 lbs.

Max. Distance Spindle Center to Column—21"

Max. Distance Chuck Nose to Base—16 1/2"

Greatest accuracy. Rugged. Free of vibration. Precision ball bearing mounted.



**Tilts to any angle up to 90°  
in either position**

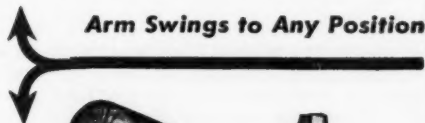
### LATEST FEATURES:

- Vertical Adjustment
- Horizontal Adjustment
- Graduation for Tilting Angle
- Spindle Adjustment
- Precision Finish
- Hand Scraped
- Column and Spindle Precision Ground

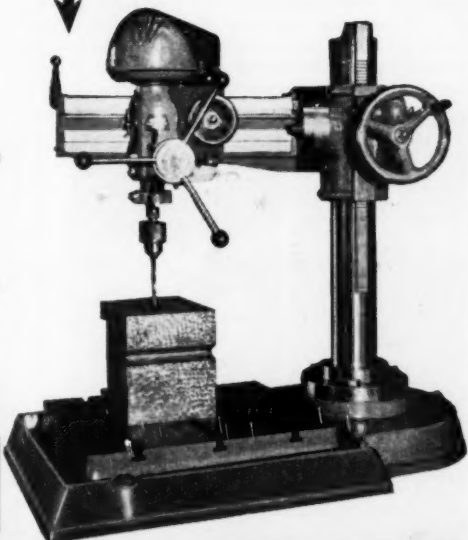
*Dealers' Inquiries Invited.*

*Write for FREE illustrated Bulletin.*

LIBERAL RENTAL TERM!  
ON TOOL ROOM AND  
PRODUCTION MACHINERY



**Arm Swings to Any Position**



Nationally Distributed by

**CAPITOL MACHINERY CORP.**

197-199 MOTT ST.

Phone WOrth 4-7615

NEW YORK 12, N. Y.

### **Standard Method X machine is universal**

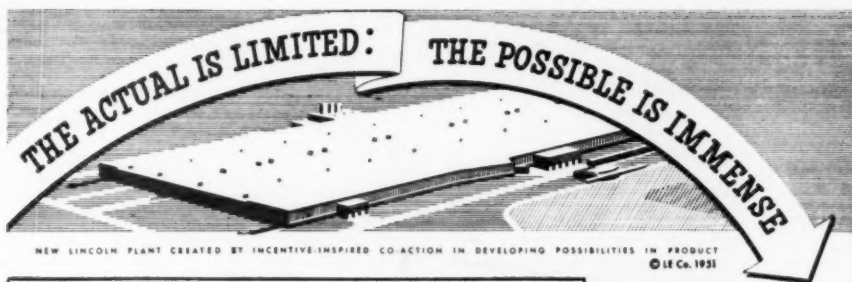
The equivalent of all machining operations ordinarily accomplished in metalworking such as boring, drilling, tapping, internal and external shaping and engraving by using the electrode as a cutting tool can be done expediently with this method. In addition it can perform some machining operations not at all practical even with ordinary machinable materials on conventional machines. For example, see the work piece in figure 5. It is a blind triangular shape, open at the apex and has an integral pin located in the center of the triangle. The shape is formed by the use of an electrode made to the shape desired and fed directly into the

work piece. A second finishing operation is performed with the use of the same electrode by cutting off the eroded end of the electrode and making necessary electrical adjustments and re-entering the electrode in the rough shaped hole.

The machine's design is similar to a drill press with a pedestal type base, an electrode feed and control mechanism, and a remote unit power supply. The machine has a work table provided for longitudinal, lateral and vertical traverse and full rotation for work alignment. Electrode feed is automatically controlled by an Amplidyne and associated circuits so that optimum cutting speeds for a given cutting condition is maintained. The power supply

**6. and 7. The Method-X machine performs all machining operations . . .** ordinarily accomplished in metalworking such as boring, drilling, tapping, internal and external shaping and engraving. An electrode, negative of the shape to be produced, is fed directly into the material. The loosened particles are carried away from the work area by a dielectric fluid in which the machining operation takes place. The machine operates from a remote power supply fed from a 220 volt, 60 cycle, single-phase line. Peak power demand does not exceed 7 kilowatts.





NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951



**Fig. 3. Saves 31% Cost by forming lever arm and pad as integral piece from 10 gauge metal. Weighs 2.5 pounds... costs \$46.**



**Fig. 4. Saves 67%. Eliminates Broaching. Hub with integral key is produced by stacking stampings in assembly. Arm is 10 gauge, brake formed and welded to hub. Cost is only 31¢... weight 2.2 pounds.**

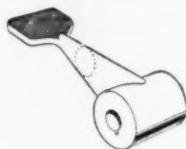
## HOW ECONOMIES OF WELDED STEEL CUT YOUR PRODUCTION COSTS

WHEN designs utilize the economies of welded steel construction, invariably costs are less. That's because fewer pounds of less costly material are needed... Each pound of metal can be more easily concentrated where it does the most good.

Wherever costs are higher, inevitably the designs have fallen short of embodying the potential savings, or the products themselves have been overdesigned. A careful reappraisal by the shop before a design is "frozen" simplifies construction details and eliminates every unnecessary expense for lowest cost of manufacture.

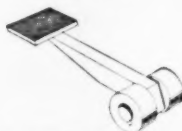
Your Lincoln Welding Engineer will gladly help you analyze your designs and point out various cost reduction possibilities. Simply call or write.

## the ACTUAL



**Fig. 1. Traditional Construction. Machine foot-lever, 10 inches long, weighs 6 pounds. Cost with broached keyway is \$1.15.**

## increasing the YIELD



**Fig. 2. Simple Steel Design Costs 34% Less. Can be built by the shop with only saw and shears. Weighs 2.7 pounds... costs 68¢ complete with keyway.**

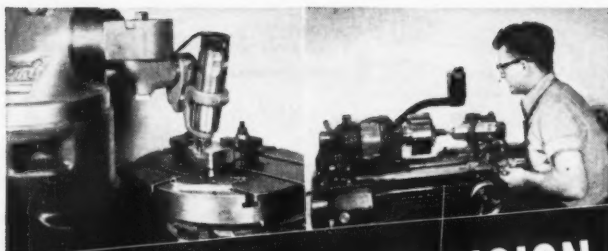
## the IMMENSITY of the POSSIBLE

Unlimited opportunities to create efficient, lower cost designs.

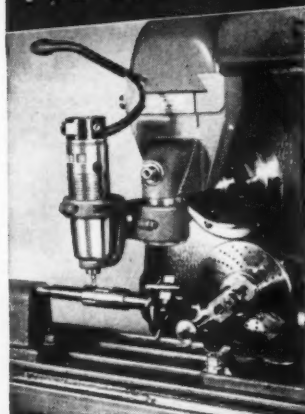
SEE HOW STEEL BUILDS IT WITH LESS MATERIAL

Machine Design Sheets are available to designers and engineers. Simply write on your letterhead to Dept. 266.

**THE LINCOLN ELECTRIC COMPANY**  
CLEVELAND 1, OHIO



## LOWEST COST PRECISION FOR TOOL ROOM AND PRODUCTION



**ONE PORTABLE MULTI-PURPOSE PRECISE GRINDER-MILLER WITH MACHINE TOOL MOUNT DOES THE WORK OF A SINGLE-PURPOSE MACHINE COSTING 100 TIMES AS MUCH!**

Little can be done today to reduce labor and material costs. For substantial savings employ new, better techniques. Mount PRECISE Grinder-Millers on lathes, drill presses, milling machines and other machine tools or use in special production set-ups.  $\frac{1}{2}$  HP; speeds from 20,000 to 15,000 r.p.m.; 115 volts, AC-DC. Ruggedly built for continuous duty. All metal housing; rigid PRECISE quill; sealed micro-precision bearings. High speeds and accurate PRECISE quill and chuck are ideal for tungsten carbide cutters. PRECISE will grind, mill or finish any material from soft wood to the hardest alloy steel.

*Write* FOR CATALOG

PRECISE PRODUCTS CO.,

1331 Clark St., Racine, Wis.

## PRECISE GRINDER-MILLERS

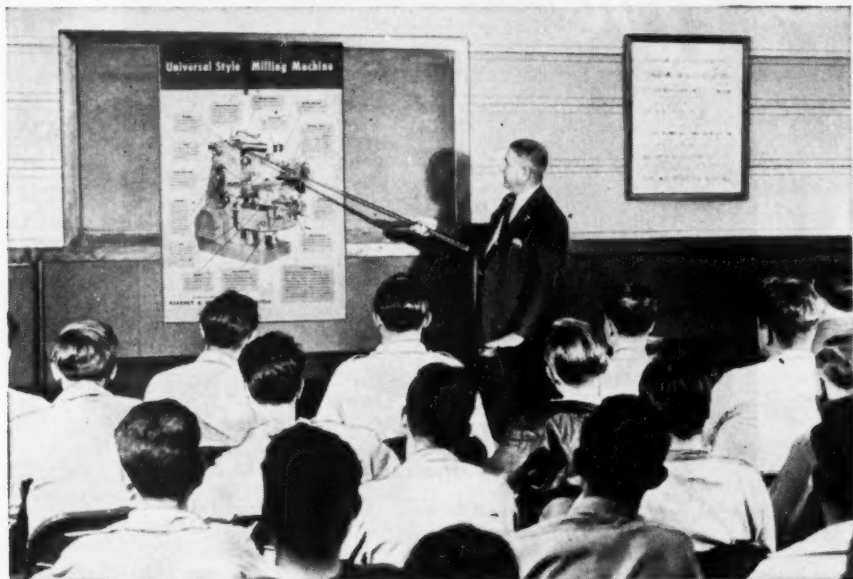
is fed from 220 volt, 60 cycle, single-phase lines. The peak demand under the most severe cutting conditions does not exceed 7 kilowatts, figure 6 and 7.

A dielectric fluid such as fuel oil, kerosene or a compound especially developed for this purpose, Dielectro X, is used to enclose the cutting operation. The purpose of the work submersion in the Dielectro fluid is to build up electrical resistance so that the energy

storage devices in the machine may be fully charged prior to discharge. Secondly, to flush the loosened particles from the work area. No fluid is lost except through evaporation or carry off on the fabricated parts.

Electrodes are made of a highly conductive, easily machined material, such as brass although other conducting materials may be used. They are usually machined to a negative of the shape to

# HOW TO SPEED UP TRAINING OF MILLING MACHINE OPERATORS



## Kearney & Trecker visual training aids can

Save time training operators . . . Help train supervisory personnel  
Improve vocational school machine shop courses

As a service to industry and education, Kearney & Trecker offers three visual aids to complement your training of milling machine operators.

These visual aids can help you train operators faster . . . do a more complete job. Send for the ones that can help you. Kearney & Trecker Corp., 6784 West National Ave., Milwaukee 14, Wisconsin.

**FILM COURSE** — We will loan you, without charge, a complete sound-slide, five-part training film (in color) on good machine tool practice. With instructor's guide.\*

**ELEMENTARY HANDBOOKS** — Book I, "The Right and Wrong in Milling Practice," covers operation of the milling machine including job setup, taking the cut, selection and care of cutters, housekeeping and safety precautions.

Book II, "The Milling Machine and Its Attachments" covers the principles of milling machine design, construction and attachments.

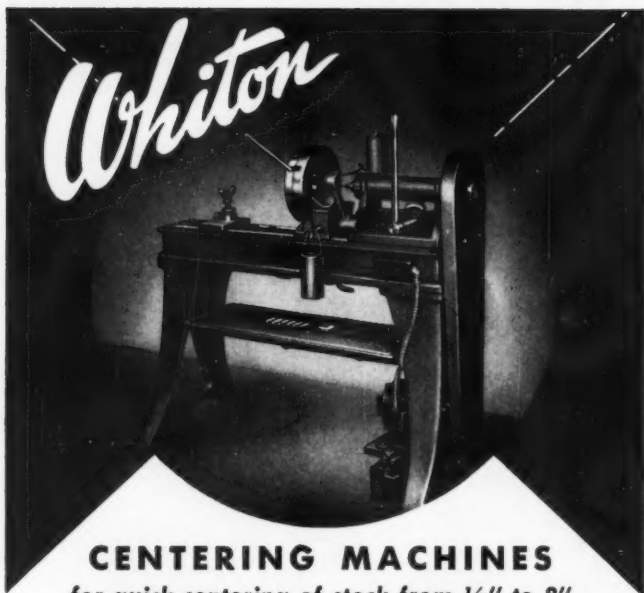
Books I and II are 50¢ each. Make remittance out to Kearney & Trecker Corp., Milwaukee 14, Wis. Check or money order.

\* No C.O.D.'s or stamps please.

**POSTER STUDYVIEW OF UNIVERSAL STYLE MILLING MACHINE** — This big 40" x 60" color studyview of a universal milling machine gives the beginner a clearly defined illustration of the machine, its construction, operation and maintenance. No charge.\*

\*All applications should be made on official company or school letterhead. Trainees can make individual purchases of Books I and II without official letterhead. Instructors can make group purchases of Books I and II.





3 or 4 jaw lever operated universal chucks center and hold work. A standard tapered hole in the spindle provides for holding combination or twist drills of suitable size. Spindle traverse is actuated by a feed lever. Machine is completely motorized. Also available are single spindle single head screw feed floor and bench types as well as single spindle double head centering machines. Write for Bulletin C-1 now.



THE WHITON MACHINE COMPANY  
NEW LONDON, CONN., U.S.A.

Makers of Fine Chucks • Special Purpose Milling Machines  
Gear Cutting Machines • Steam Turbines

be produced when the machining operation can be performed with the head moving in a vertical direction. When the machine is required to revolve, or the work table traverse, for an internal, irregular contour such as illustrated in figure 5, an electrode or brass wire bent to the necessary working angle is all that is required since the tool does not make physical contact with the work.

All secrecy restrictions imposed by the government in the interest of national defense have been rescinded and the Method X Company is permitted to furnish all the essential information concerning the use of the process. Inquiries may be directed to Firth Sterling Steel & Carbide Corp., 3113 Forbes St., Dept. BB, Pittsburgh 30, Pa.

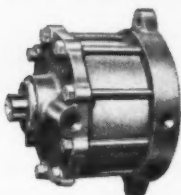
**The End**

**Tell Us Your Production Problems...  
We'll Help You Solve Them**

# "LOGAN" Rotating and Nonrotating AIR CYLINDERS

**Fast-Acting, Positive Controlled Power.. At LOW COST**

## NONROTATING— 7 STANDARD MOUNTING TYPES



Standard sizes from 1½" to 12" bore; maximum stroke, 18 feet. Special models to meet your requirements.

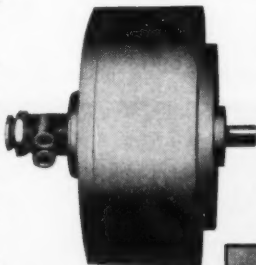
Logan Features — Larger

Ports... More Sturdy Construction... Maximum Power Without Leakage... Permanent Seal Around Piston Rod... Standard Models Available With or Without Cushioning.

## ROTATING —

Two Standard Styles — Model R with cast iron body; Model K with light-weight aluminum body.

Bore diameter 1½" to 20"; piston stroke 1" to 2"; longer strokes available as special. American Standard adaptations; simple, efficient design to assure positive, rapid, economical operation.



**Logan Manufactures  
6,975 Standard  
Cataloged Items**

**Free Catalog On Request**

### AIR CONTROL VALVES

CATALOG 100-4

### AIR CHUCKS

CATALOG 70-1

### AIR CYLINDERS

CATALOG 100-1

### AIR and HYDRAULIC PRESSES

CATALOG 51

### COLLET GRIP TUBE FITTINGS

CATALOG 44

### HYDRAULIC CONTROL VALVES

CATALOG 200-4

### HYDRAULIC CYLINDERS

CATALOG 200-2; ALSO 80-2

### HYDRAULIC POWER UNITS

CATALOG 200-1

### SURE-FLOW COOLANT PUMPS

CATALOG 62

Let Logan Engineers  
help you design your Air  
and Hydraulic Circuits.

**Logan**  
*Air and Hydraulic Equipment*

**SAVES**  
\* TIME  
\* EFFORT  
\* MOTION

LOGANSPOUT MACHINE CO., INC.

803 Center Ave.  
Logansport, Ind.

**FLUID POWER SPECIALISTS SINCE 1916**

## **Developments in European machine tools and accessories . . . as seen at the recent trade fairs**

by Paul Grodzinski, A.M.I. Mech. E.

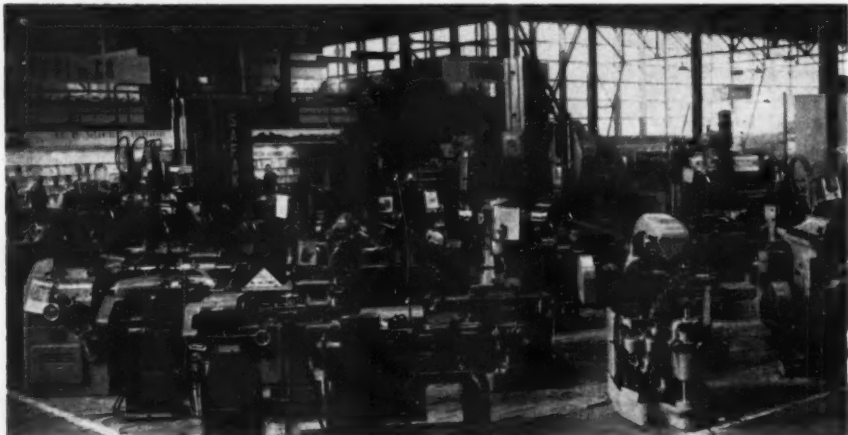
IT IS AXIOMATIC throughout the world: if one would know what's new in equipment and accessories one must attend trade fairs. The 1951 European trade fairs were no exception. While there was an absence of revolutionary developments, the exhibits were significant because they pointed up the strong progress made by the European manufacturers.

Because of the trying and tense international situation, and the need for

all countries to pool their technical knowledge, these trade fairs give a hint of the trend, as expressed by the barometer of industry, the machine tool industry, of industrial progress.

**Hanover:** After only the fifth year of existence, a surprising array of all types of machine tools were shown. While the 1950 show was one of a recovering industry with slight advances as against pre-war models and a few new machines with sound ideas, the 1951

One of the Continental Trade Fairs before being opened to the public.



# Who's Training *Your* New Employees . . .

Don't put your new employee  
in this position . . . . Help  
him off to a good start with  
the proper training aids . . . .



Now available . . . . **CARBIDE CUTTING TOOLS**, the first  
authoritative text book on carbides, designed to inform  
the student, the designer and the man at the machine.



"KNOW HOW"—the best productive use of man-  
power, machines and materials is essential in our  
present emergency. It is with this in mind that V-R  
is making this book available

**CONTENTS:** Machine Tools and the Carbides. Converting  
to Carbides. Tool Angles, Machinability. Tipping a  
Carbide Tool. Grinding Single-Point Tools. Cutting Pow-  
er, Speeds, Feeds. Carbide Tool Design. Coolants and  
Carbide Tools. Carbide Forming Tools. Carbide Mill-  
ing Cutters. Sharpening Milling Cutters. Multiple-Edge  
Carbide Tools. Cutting Speeds, Feeds, Forces. Multiple-  
Edge Tool Design. Selection of a Carbide. Tool Mate-  
rials, Assembly. Grinding and Use of Tools. Index.

416 Pages. 283 Illus. Washable Cloth Binding.

Price \$5.50

Companies' purchase orders will be subject to our regular  
terms. Book orders from individuals should be accompanied  
by check or money order. Please do not send cash because we  
will not be responsible. All books shipped prepaid. Offer limited  
to U. S. and Canada. United States funds only.

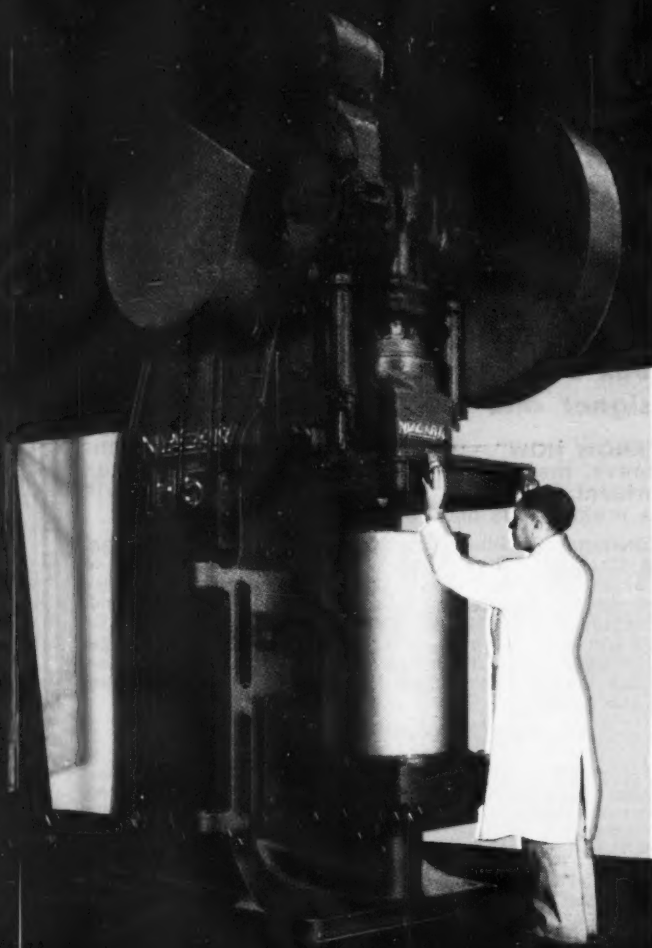
**FREE** . . . With each book purchased for your training program, a complete study  
guide specially prepared for V-R by the American Technical Society will be furnished  
without charge—compliments of Vascoloy-Ramet Corporation.

Send all Book Orders to: EDUCATIONAL TRAINING DEPARTMENT

**VASCOLOY-RAMET**  
CORPORATION  
WAUKEGAN, ILLINOIS



# NIAGARA



\* In addition to ordinary blanking and forming work, these presses can be used for a variety of other operations requiring exceptional die height, such as curling, wiring and flanging container bodies. When fitted with a horn they can perform seaming, piercing, riveting and forming operations on the sides of formed shells.

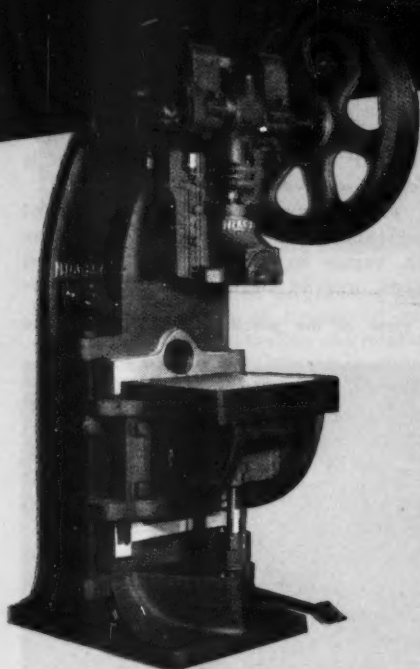
*Write for specifications on sizes to fit your requirements.*

Niagara H-5 Geared Horn Press with air sleeve clutch and air releasing brake. Arranged with special table and dies for curling and flanging the ends of a 55 gallon 18-gage steel drum body.

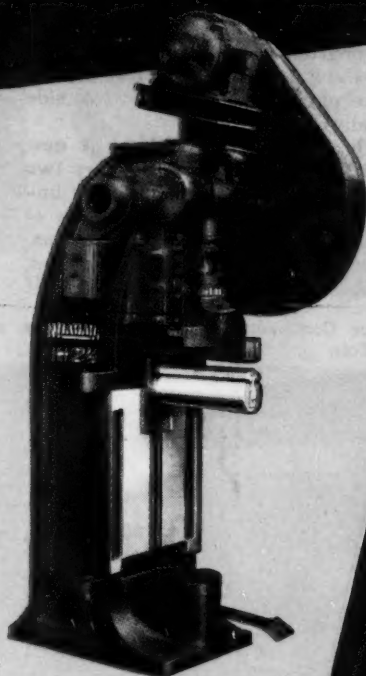
**NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.**

# ADJUSTABLE BED HORN PRESSES

*offer Versatility for  
Defense Production*



**Standard Niagara H-3 Horn Press with swinging, screw-adjustable table.**



**Niagara H-2½ Horn Press with duplex side seaming horn.**

*America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work*

**DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK**

show featured a preponderance of a series of machines, as well as the largest machines ever produced.

**Basel:** Exhibits of strong machine tools and precision machine tools, the admiration and ideal of every tool engineer. Apparently few things were new. The idea of rigid mills and rigid lathes makes progress.

**Milano:** The product of having mixed thoroughly the machines of all Continental nations, including those from the States. First appearance, in 16 years, at a West-European show, of Russian machine tools. Italian machines, with rare exceptions, still in the copying stage, but with a great sense of improving proportions.

**Paris and Birmingham:** More or less absence of machine tools, but tool side not badly represented.

**Techni-Show, Rotterdam:** A new undertaking to demonstrate, every two years, tools and machines made or imported into Holland. Preponderance of German (West and East), American, French, English and Swedish machines, but also some interesting signs of

Dutch products of high quality, primarily in precision lathes, grinders, shaping machines and eccentric presses.

### Summary of tools and machines

**Carbide Grinders:** Tendency to reduce wheel diameter and to increase spindle speeds to use small diamond wheels. Radiusing device considered to be essential. Newest vogue to arrange wheel inside of roughing wheel and bring the wheel faces into same plane by a shifting mechanism.

**Vises:** Latest improvement is hydraulic cylinder added to screw-operated vises. Hydraulic cylinder comes only into operation when component is clamped, then permits increasing pressure. With ordinary screw vise pressure of 200 kg/sq. cm can be achieved only with great effort; with this new combination pressure of 350 kg/sq. cm is easily achieved.

**Toolholders:** Exchangeable, height adjustable tool holders for small lathes in vogue in Switzerland, movement goes over to Germany. Flexible tool-

Another Continental Trade Fair. This is a view of the machinery exhibits of the Basel Fair.



For those tough *Special* jobs... depend on  
**NATIONAL TOOL CO.**  
 and our field representatives from coast to coast



National Tool Co. engineers are backed by years of successful experience in special tooling and related problems. Their assistance is yours for the asking—whether you're interested in one tool or the tooling program for a whole plant.

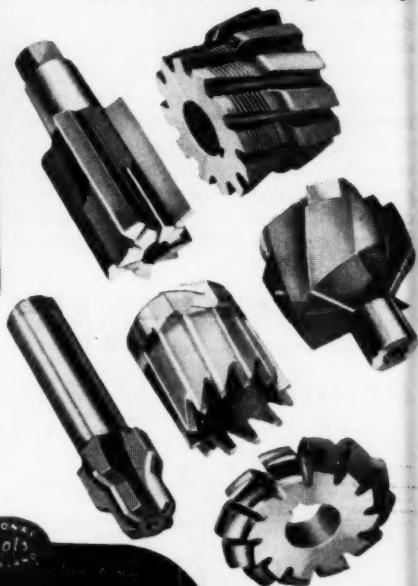
A partial list of  
*special* tools  
 engineered and  
 manufactured by  
 National Tool Company

↓  
 Gear Shaper Cutters  
 Herringbone Gear Cutters  
 Ground and Unground  
 Gear and Spline Hobs  
 Master Gears

Milling Cutters  
 Broaches  
 Tungsten Carbide Tools  
 Sprocket Cutters  
 Profile Form Mills

Chamfering Cutters  
 Rotary Gear Cutters  
 Circular Form Tools  
 Gang Cutters  
 Flat Form Tools

*Since 1905* engineers  
 and manufacturers of high-  
 quality special cutting tools  
 for the metal-working industry



Representatives  
 in major  
 industrial centers

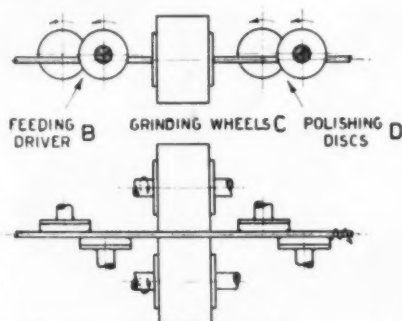
holder for cut-off operations with adjustable rubber buffer, inbuilt in tool holder body. Toolholders with exchangeable bits in great favor.

**Superfinishing:** New attachment for external and internal superfinishing claims to achieve highest surface finish in shortest time.

**Diamond impregnated files:** Made by the galvanoplastic process, diamond files can be fitted to high speed vertical filing machines and used for grinding and lapping of form parts.

**Chipbreaker grooves:** A number of new machines and attachments to produce chipbreaker grooves using diamond grinding wheels.

**Vises for workpieces of arbitrary form:** Several new and improved versions were seen. Some rely on circular segments, balancing levers; others on parallel plates which slide in the direction of pressure and abut against several rows of balls, or are clamped rigidly.



1. Schumag centerless grinder . . . with feed and burnishing (polishing) discs.

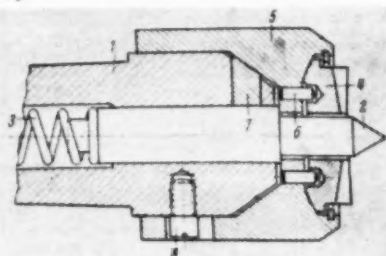
**Unorthodox machines:** By changing the basic arrangement, or better, the accepted or conventional arrangement, sometimes new and interesting machine types are created. In the usual type of centerless grinders the two wheel axes are in horizontal plane. In the Nomoco design they are in a ver-

tical p'ane. The workrest is thus changed to a plate which allows the workpieces to be fed through between the wheels. The Schumag bar grinder does not rely on the automatic feed of the bar through inclination of the control wheel, but provides driven discs which contact, with their faces, the rotating bar. Such a friction drive, at the entrance side, feeds the bar in, and at the exit side burnishes the ground bar, see figure 1.

Avoiding heavy overhead castings the E. Krause, Vienna fine boring machine, bores from below upwards. The Tor glass drilling machine has two coaxial spindles one operating from above the other from below. Accurate holes are produced without breaking out the edges.

**Lathe center with carrier:** This allows the turning workpieces between centers from one end to the other, without being hindered by the conventional lathe dog. In body 1 (figure 2) fixed by taper or flange to the lathe spindle, the lathe center 2 has a sliding fit and abuts against spring 3. The workpiece is pressed against the radial teeth of the carrier disc 4. This disc abuts against a spherical face in outer ring 5, both parts are connected by pins 6. The pressure exerted on the disc 4 causes three radial jaws 7 to press

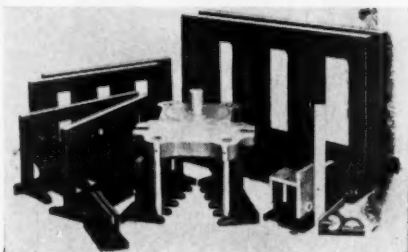
2. Lathe center with carrier . . . which permits the turning of work-pieces between centers from one end to the other, without being hindered by the conventional lathe dog.



MACHINE and TOOL BLUE BOOK

# The **M**AGIC **P**ARALLELS

*Arrest Lost Time*

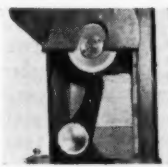
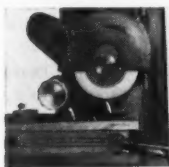


A SIZE FOR YOUR NEEDS

## and **M**AGIC DIAMOND HOLDER

### Saves Machines for Defense

- Elevation Screw and Nut
- Spindle Housing or Knee Ways
- Gears and Bearings



O  
U  
T  
S  
I  
D  
E



I  
N  
S  
I  
D  
E

SALESMEN WANTED

Write for  
Circular  
and Prices

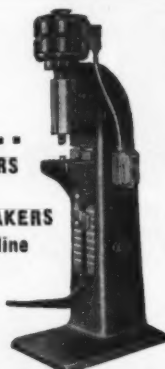
**MAGIC CITY MACHINE TOOL CO.**  
Dept. BB 2128 S. Walnut Muncie, Ind.

# GRANT

## RIVETERS...



**PIONEERS  
and  
PACEMAKERS  
in their line**

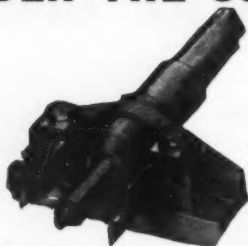


—head rivets from smallest to  $\frac{3}{4}$ " diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—sizes to meet all needs—types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

**THE GRANT MFG. & MACHINE CO.**  
C E Station, Bridgeport 5, Conn.

## SOMETHING NEW UNDER THE SUN



Finished holes  $1\frac{1}{2}$ " to  $11\frac{3}{4}$ " diameter to a depth of 8" in one rapid operation on your present equipment

with  
**THE BOREMASTER**

Not just another Trepanning Cutter but a real heavy duty tool. Stock removed in one piece eliminating waste.

TIME SAVINGS + MATERIAL SAVINGS  
= COST SAVINGS

For full details write

**KARL A. NEISE**

381 Fourth Ave., Dept. BB, New York 16, N.Y.

against center spindle 2, so that it cannot move. A cylindrical screwhead 8 prevents rotation of ring 5 against body 1. On the tailstock side a rotating center is provided. In this the center is under spring load (disc spring). This spring is only deformed for  $\frac{1}{2}$  of its full extent by the clamping pressure, so that it is still flexible for the heat extension of the workpiece. A good running of the center is assured by two adjustable roller bearings and another adjustable roller bearing in the tail end.

**Application of Magnets:** A Perspex screen with universal link attachment can be brought into the best possible position towards the workpiece by a cylindrical permanent magnetic base. Another useful application for permanent magnets is as prism base for rider gauges. A number of different models with micrometer adjustment and equipped with dial gauges were shown.

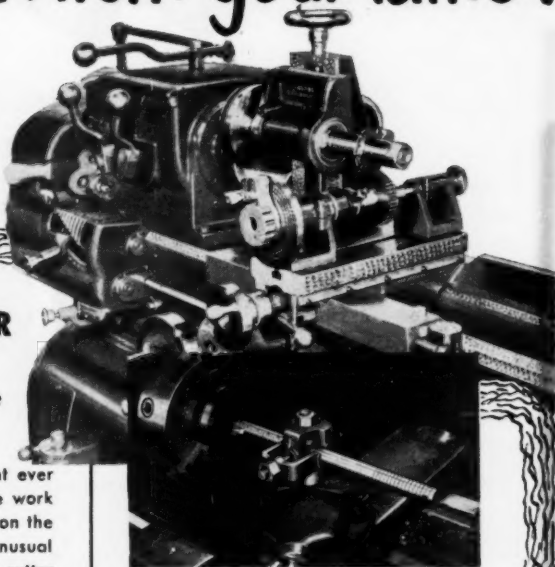
**Copying Lathes:** In Basel and Hanover one could count about 12 different solutions which show the great demand for this particular type of equipment which is also well developed in the States.

The high speed lathe of E. Dubied & Co. is intended for the full utilization of sintered carbide tools. Driving motor 3.5 KW; 8 spindle speeds up to 4000 r.p.m. The longitudinal slide moves in guides on the front side of a triangular-shape bed; both longitudinal and transverse slide are hydraulically operated. The tool is adjusted at 30 deg. to the normal to the lathe axis. The feed is controlled by the scanning of a template; pressure between stylus and template is 1 kg (2.2 lb).

The Bondy S.A. Fribourg, Switzerland, has developed a hydraulic copying device (Bondycop) which can be fitted to practically any lathe and copies directly from a workpiece. This is a particular advantage of this device demonstrated both in Basel and

**YOU CAN GET**  
**more work from your lathe!**

**WITH THESE**  
**GLOBE**  
**ACCESSORIES**



**GLOBE MILLER**

**converts lathe  
to milling machine  
in 3 minutes!**

Best milling attachment ever developed! Keeps the work low, solidly mounted on the table! Possesses unusual vertical travel—spots the cutter or drill wherever needed! Performs all miller functions: faces, form cuts, slits, bores, drills, locates; cuts tee slots, keyways, dovetails, gears etc.

Mounts a chuck for an additional 5" to 10" of lathe swing! Complete line of accessories available. Here's a tool that can save you the cost of a mill or relieve an overworked mill! Write for literature on the GLOBE Miller.

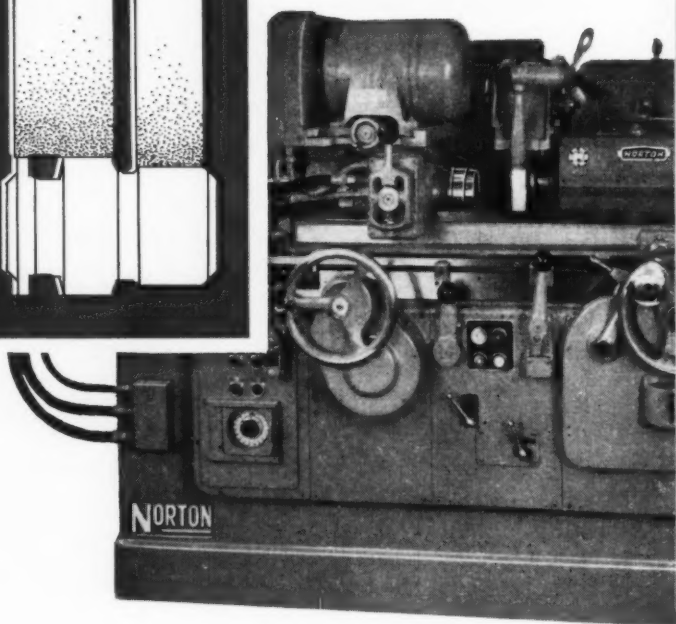
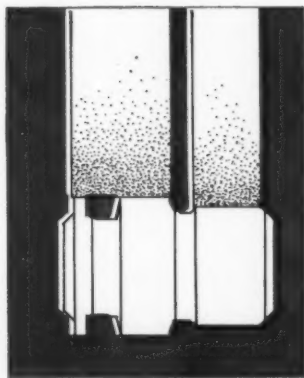
**GLOBE BORING BARS and HOLDERS**

In the GLOBE Boring Bar Holder two independent clamps are used—one mounts the holder to the lathe compound, the other grips the bar. Once mounted bars can be interchanged at will without altering alignment of bar with lathe bore! Vertical Vee block automatically locates cutter bits at correct height—regardless of bit size used—without shimming or other adjustment. Graduated bars instantly indicate depth of bore, saving measuring time. Rigid design eliminates chatter—insures heavy cuts and smooth finishes. Many sizes for all lathes. Write for circular.

★ **GLOBE** ★  
**HEAT-SEAL, INC.**  
MACHINE TOOL DIVISION

3381 Robertson Boulevard  
Los Angeles 34, California

# TWO FOR ONE.



*Making better products to make other products better*

**NORTON COMPANY, WORCESTER 6, MASS., U. S. A.**  
DISTRICT SALES OFFICES: HARTFORD • NEW YORK • CLEVELAND • CHICAGO • DETROIT

# Production **DOUBLED** with NORTON

## 6" Type CTU Semiautomatic Grinders

### PROBLEM

The Jacobs Manufacturing Company, Hartford, Conn., prominent manufacturers of chucks, desired increased output in the grinding of certain of their chuck bodies. Two diameters on each body were being ground in separate operations — at a production rate per hour of 150 of a small body and 130 of a larger.

### RECOMMENDATION

Norton Engineers suggested new 6" Type CTU Semiautomatic Grinders each equipped with a Live Spindle Workhead and a two-wheel mount — to grind both diameters simultaneously.

### RESULT

Jacobs Manufacturing Company now finishes more than TWICE as many pieces per hour with each Norton 6" Type CTU Semiautomatic Grinder. Furthermore, all pieces are finished with better concentricity, thereby rejections are reduced. Still another case history of how you can economize by modernizing with new Norton Machines.

To Economize  
Modernize  
with NEW

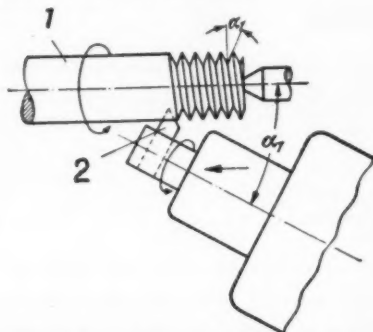
**NORTON**

GRINDERS and LAPPERS

Hanover. Some German manufacturers (Martin, Weisser & Co.) showed this device fitted to their lathes.

The Heyligenstaedt lathe with copying device has both saddles, the upper one at 45° inclined to the lower one, electrically synchronized, thus avoiding mechanical feed arrangements. The upper slide is hydraulically controlled by a template. The Schaerer lathe had a hydraulic copying device (Bondycop) which copies either from a sample or template.

Loewe showed an electrically controlled copying device. The DC motor with valve controlled speed regulation is controlled by a potentiometer in the copying support, so that during operation the cutting speed of longitudinal and transverse direction are kept constant for a ratio of 1 in 6.



**3. Principle of impact cutting of threads (System Burgsmueller) . . . 1 workpiece; 2 single tooth sintered carbide cutter.**

Heinemann 'Hydrokopist' is a hydraulic profiling attachment for a semi-automatic multitools lathe. The profiling attachment operated from a flat template is mounted on the front slide in place of the usual toolboxes; two or even three profiling attachments can be carried on the slide and the profile is divided between them. Thus long profiles can be turned with a limited travel of the slide. A self-contained hydraulic

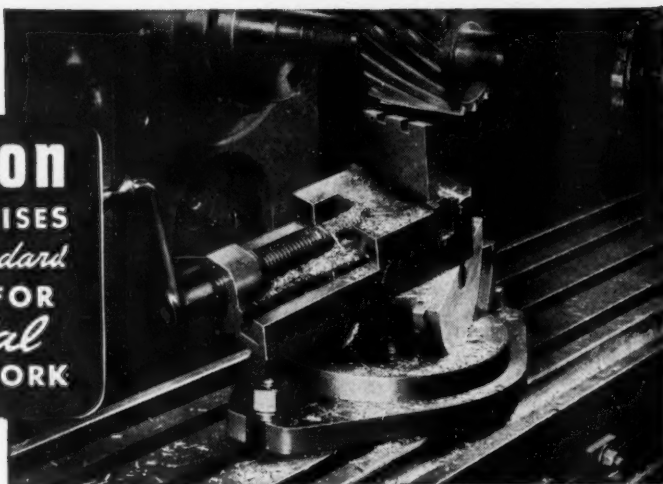
pump feeds the unit. Compressed air cylinders actuate clutches which control the operation cycle on Heinemann semi-automatic multi tool lathes. A single lever operates the tailstock chuck and starts spindle rotation.

George Fischer has developed a new lathe with tool carriage and template above the work instead of below; this assures better chip clearance and easier loading of the work. A hand indexed adjustable stop with 6 positions gives predetermined depths of cut. The tool saddle can be adjusted vertically as well as at an angle of 30 deg. to the vertical. This allows for turning steep angles and profiling on the headstock side. Also an earlier design KD 11 was shown arranged for the recycling with two templates: one for roughing, the other for

**3A. Impact cutting of threads . . . Present form of apparatus.**



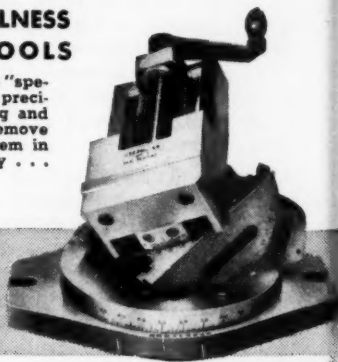
**WESSON**  
**ANGLE VISES**  
 USE *Standard*  
**TOOLS FOR**  
*Special*  
**ANGLE WORK**



These are high precision, top quality, 3-way angle vises that can be relied upon to slash set-up time on difficult compound angle machining with standard machine tools. Save many man-hours . . . quickly liquidate the vise cost . . . assure uniform angle accuracy in toolroom or production duty.

**ORDER NOW—*Multiply* THE USEFULNESS  
 OF YOUR *Standard* MACHINE TOOLS**

Standard machines can be transformed instantly into "special" angle machines with WESSON Vises . . . for precision angle milling, drilling, grinding, tool sharpening and many other difficult angle machining jobs. You can remove vise without altering set-up. Buy several — use them in series on many machines . . . save time and money . . . boost production!



**WESSON**  
*Universal* **VICES**  
 BUILT TO WESSON STANDARDS OF  
 QUALITY AND PRECISION

WESSON PRODUCTS CO.  
 1220 Woodward Hts. Blvd.  
 Ferndale (Detroit 20,) Mich.

Please send me illustrated  
 bulletin of WESSON Universal  
 VISES and ANGLE PLATES.

.....  
 Name and Title

.....  
 Firm Name

.....  
 Address

.....  
 City

.....  
 State

finishing. The templates are mounted on a carrier between centers. The carrier is automatically rotated through a small angle to bring each template in turn into its working position.

On an Oerlikon lathe a hydraulic copying equipment is provided for internal and external, longitudinal or traverse copying. This can be fitted to all highspeed lathes of this firm.

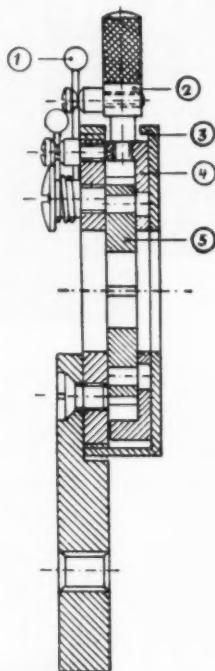
At the BIF the Metrovick hydraulically operated copying attachment was shown fitted to a center lathe. The same equipment can be fitted to boring and milling machines as well as planers. The special feature is the forced balance hydraulic circuit. It may be mentioned that this firm has also developed an electronically controlled two-dimensional copying system for more complicated work.

**High speed thread generation:** During the war a new method of high speed thread generation was developed in Germany called: Gewindewirbeln. In this a single tooth sintered carbide cutter was rotated at high speed and fed along the workpiece, figure 3. Burgsmueller, the inventor of this method has further improved this method by providing a special attachment to lathes, figure 3A.

The copying devices described in the previous paragraph also permit a high speed thread generation. In this instance the thread cutting itself is performed in the conventional way. The copying attachment is equipped with a special template which only withdraws the thread cutting tool automatically at the end of the operation. Obviously, a much higher cutting speed can now be applied as there is no danger of the sensitive thread cutting tool running against a shoulder.

**New steady rests for lathes:** The difficulties of turning long slender work are well known. A new attachment of avoiding this, is the Haiss steady rest,

shown at Hanover, figure 4. It can easily be attached to light and medium lathes or grinding machines. The apparatus, which is of fixed height adjustable to a bracket on the longitudinal slide of the lathe, has two exchangeable supporting jaws 5 which are sliding



4. Haiss steady rest . . . 1 spring; 2 lever for disc 4; 3 cover plate for adjusting axial pressure; 4 adjusting disc; 5 exchangeable jaws.

in inclined guides in the rotatable disc 4; this is effected by lever 2, whereby the distance between the jaws is adjusted. A spring similar to those on hinges or mouse traps prevents an unintended movement of disc 4. The guides are inclined at about 9 deg., so that the cutting force cannot effect any diameter changes. For workpiece with reducing diameters the jaws are under



## HOW TO PUT YOUR PLANT in the Pink

If your plant is suffering from painfully high metal cutting costs, prescribe CIMCOOL®! This revolutionary cutting fluid—this *chemical emulsion*—saves you money three important ways:

*Rx* CIMCOOL INCREASES TOOL LIFE (and thus reduces down time) because of its chemical lubricity.

*Rx* FASTER SPEEDS are possible because Cimcool cools faster, through a unique physical change in the coolant itself. Tools and chips actually stay cool to the touch.

*Rx* CIMCOOL COSTS LESS than old-fashioned coolants. It lasts longer, cuts labor costs for cleaning and changing. It virtually eliminates rancidity and foul odors. Due to its low surface tension and low adhesion to work and chips, there is practically no carry off.

For a demonstration in one of your own machines, just write us. We'll have one of our Cincinnati Milling-trained machinists call on you—without cost or obligation. Or, if you prefer, write for our free booklet "CIMCOOL Gives the Answers." Address, Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

®Trade Mark Reg. U.S. Pat Off.

**A Production-Proved  
Product of**  
THE CINCINNATI MILLING  
MACHINE CO.



*for*

**85%**

OF ALL METAL CUTTING JOBS

spring pressure. The resistance of the jaws can be finely adjusted by cover 3 being provided with a fine thread. With this steady rest very long slender parts with or without profile can be machined; it has also been found useful for circular grinding and winding of springs.



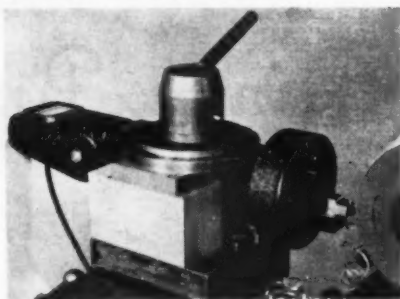
**5. Novel superfinishing device . . .** with hydraulic pressure control suspension in steel bands.

As a working example it is quoted that a bar of 13/16 in. dia., and 28 in. long, of steel St. 70.11 (tensile strength 44,000 lb./sq. in.) was tapered down to diameters from 0.710 to 0.236 in. in a single cut chucked only on one end.

A further novelty is the self-centering steady rest of J. Hoeffken. This contains three holders arranged at 120 deg. Each is provided with a ball-bearing roller pressing against the periphery of the workpiece. The holders are guided in spiral-shaped grooves of a rotating cam plate in the body of the steady rest. By rotating the cam plate the rollers are approached or withdrawn from the center.

#### **Profile turning and boring equipment:**

At Basel two interesting profile turning and boring heads were demonstrated, using templates for guiding the tool. With one template various sizes can be produced in an adjusting range of about 20 mm. With two templates, for instance, of hexagonal form, all sizes of hexagons, external or internal, can be produced from 0 to 36 mm between flats; in the case of squares 2 templates cover the range from 0 to 30 mm between flats. The accuracy is about plus or minus 0.01 mm. Sharp corners can be produced. The cutting speed for medium sizes of profiles are between 240 to 600 m/min. For profiles without sharp corners, i.e., ovals, higher speeds can be employed. As production time for a hexagon  $\frac{5}{8}$  in. between flats, and a depth of  $\frac{3}{8}$  in. in standard mild steel, a time of 2 min. is quoted (Armag, Gumlingen-Bern).



**6. One-component cutting dynamometer . . .** with recording device according to Schumann.

**Heavy Machine Tools:** Similar to its predecessor, the Leipziger Messe, the Hanover Trade Fair tried to impress the visitors with a demonstration of heavy machine tools. The following were quite remarkable: Waldrich rigid planing machine of 130 tons weight with a main driving motor of 100 KW (Ward-Leonard Control). Table length 10 m, table width 3 m. This machine has no operating handwheels; owing to the

*Remember!*

**ALLEN  
COLLETS**



Can be depended on for the Best Performance, Extreme Accuracy, Concentricity, Longer Life.



**MAIL COUPON TODAY!**

**ALLEN COLLET MFG. CO., INC.**  
17720 Claran Ave.  
Melvindale, Michigan

Please send catalog and prices.

NAME .....

TITLE .....

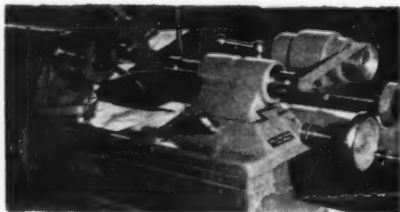
COMPANY .....

STREET NO. ....

CITY ..... ZONE .. STATE .....

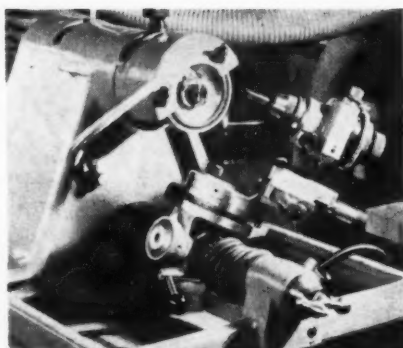
heavy loads, all controls are electrically operated. Quite near to this machine in power comes a Gildemeister Planomilling machine with a total motor capacity of over 100 h.p. with a weight of 60 tons. The milling heads of this double column machine are standardized units. There are two vertical and two horizontal heads.

**Turning with uniform cutting speed:** Max Müller, Hanover, showed a lathe with electronic stepless speed variation in relation to the distance of the work-piece from the center so that the cutting speed remained always the same. In facing work one could see that the appearance of the cut surface did not change.



**7. Overbeck precision grinder . . .** for tool room work. Grinder has spindle speeds up to 80,000 r.p.m.

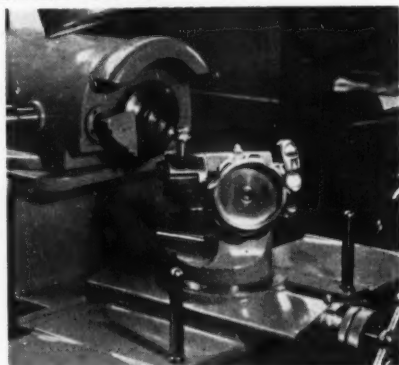
**Lapping and Honing:** Wieck & Heim KG. showed their new oscillating grinding method "Schwingschleifen," figure 5. In these machines the hone stones are movable on a bar which vibrates by means of a band suspension and is connected with the vibrating system. The vibrations are caused by compressed air. Care is taken that no unbalanced forces are exerted to the machine body. The pressure of the stones is also exerted by compressed air. Surface finishes are obtained which are below 1 micron maximum height. Kloeckner - Humboldt - Deutz AG. has already produced 10,000 cam shafts with this device. The grinding time for pre-finished and finished grinding is about 1.5 min., i.e. 30 seconds for each bearing.



**8. Double wheel sintered carbide grinder . . .** The finishing wheel is arranged inside the rough grinding wheel; the hand lever on top of the spindle head permits bringing the face of the inner wheel in alignment with the other wheel, or retracting it.

Gebr. Loewe also showed a new hydraulic superfinishing device which can be mounted on a lathe. They also showed the interesting honing head after Berstecher. Besides the usual honing movement, i.e. rotary movement and reciprocating movement, a third movement has been added i.e. a high speed vibrating movement. Whilst hitherto the adjustment of the rigid honing tool and the material removed depended

**9. Special . . .** grinding machine for chip-breaker grooves.



# L-W

## SWIVEL BASE MILLING MACHINE VISES

**BUILT FOR  
BRUTE STRENGTH  
... yet REALLY LOW  
PRICED!**

*Ideal for drill press and shaper work.*

Durable. Very accurate fit. High-grade semi-steel castings. Hardened steel sliding jaws with full length bearing on a ground bar and machined ways. The 4½" and 6½" sizes have a large Acme steel screw with replaceable bronze nut. Four bolt and key slots for rigidly attaching to table so the work-holding surfaces are at true right angles or parallel to the table.

**MASTER \$54.56**

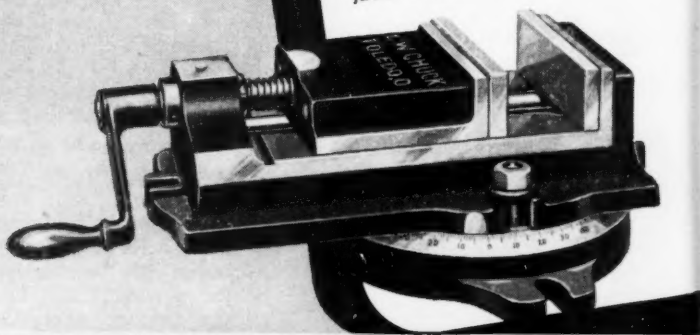
Jaws: 6½" wide, 2" deep. Opens 4" with jaws, 5¼" without. Wt. complete with crank, boxed, 85 lb.

**JUNIOR \$36.55**

Jaws: 4½" wide, 1¾" deep. Opens 3" with jaws, 3½" without. Wt. complete with crank, boxed, 40 lb.

**HUSKY \$21.85**

Jaws: 3" wide, 1" deep. Opens 2" with jaws. Wt. complete with crank, 16 lb.



Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



DYNAMOMETERS



MAGNETIC CHUCKS



DIVIDING HEADS



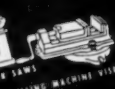
RECTIFIERS



DEMAGNETIZING UNITS



LATHE CHUCKS



UNIVERSAL CHUCKS



POWER HACK SAWS

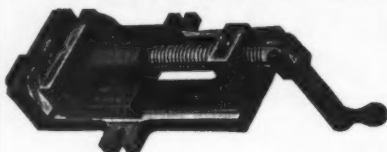


MILLING MACHINE VISES

# L-W CHUCK COMPANY

23 SO. ST. CLAIR ST.  
TOLEDO 4, OHIO

## YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, Inches	Opens Inches	Weight Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

*Write today for bulletins on the extensive Yost line*

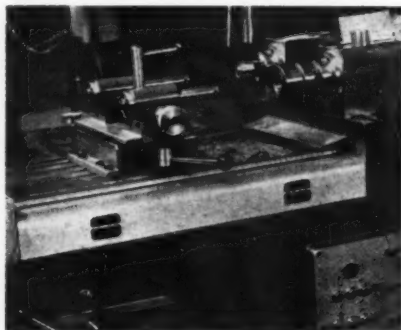
**YOST MFG. COMPANY**

1335 SO. MAIN STREET  
MEADVILLE, PENNSYLVANIA



on the sensitivity and experience of the operator, now the correct pressure of the honing stick can be adjusted to the material and the amount of material to be removed. The pressure is acting on several edges and produces short broken chips which prevent a clogging of the honing sticks. The matt surface of run-in cylinder with scratches running parallel to the axis can be obtained with this new device by stopping the rotary movement at the end of the honing operation. After each double stroke of the honing tool the oscillating movement is indexed for ½ widths of the stone.

Special lapping tools for a microlap process have been developed by Peter Wolters.

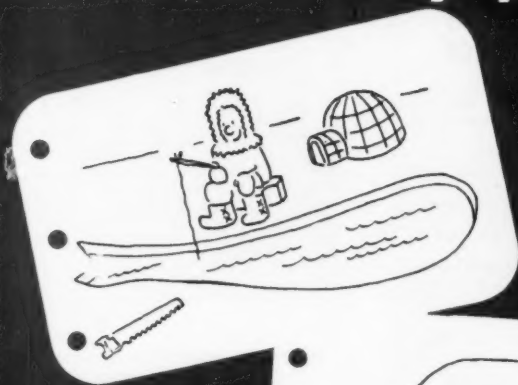


10. Fine boring machine . . . has two spindles and hydraulic feed.

**Machinability:** The cutting tool dynamometer according to Schumann measures only the vertical component of the cutting force, figure 6. It is clamped to the usual toolholder and carries the turning tool in the front. Tools with a maximum cross-section of ¾x¾ in. can be clamped. The tool is supported by a swinging lever the movement of which is transmitted to a recorder "Graphotest" mounted on the rear end. Therefore, it is not only possible to observe the cutting force momentarily, but to have the course

# INGENUITY

can solve any problem



if

**YOUR**

**PROBLEM**

involves the  
higher production of threaded parts

**HY-PRO**

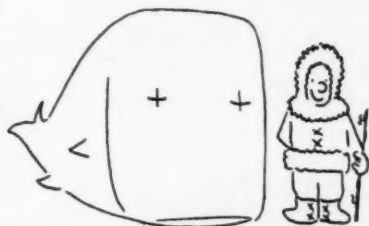
**HY-PRO**

TOOL CO.

NEW BEDFORD, MASS., U.S.A.

Subsidiary of

Continental Screw Co.



CASE HISTORY NO. 3944654022223

**TAPS**

can help you  
to a solution



Order from your distributor  
or call the HY-PRO SALES ENGINEER

## KOENIG



### TWO SEAT VERNIER DEPTH GAUGE

Of particular design, easy and quickly measures distance of projections, depth of holes, etc.

Its features:

Solid head, hardened ground and lapped.

Two Verniers, to obtain otherwise difficult measurements.

Compact design to permit the use of 1" scales.

Accurate machine divided graduations.

Furnished with case in 1" to 12" size scales — 18" and 24" also available. Prices on application.

No toolroom crib or mechanic can afford to be without one.

**WM. A. KOENIG**

134 Ferry St.

Troy, N. Y.

Telephone 3362



Pictured: a 38-Spindle Heavy Duty Drill Head

**DESIGNERS AND  
MANUFACTURERS OF  
MULTIPLE DRILLING EQUIPMENT**

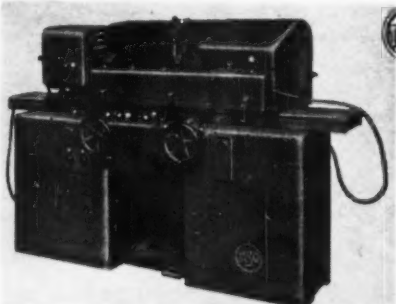
*We invite your inquiry.*

**MICHIGAN DRILL HEAD CO.**

971 E. 8 Mile Road

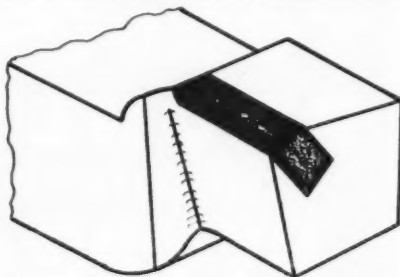
Hazel Park, Mich.

of cutting force for a number of revolutions to check the uniformity or non-uniformity of the material, or to find the influence of wear of the cutting edge. Hitherto such observations required appreciable time, which is saved by the automatically recording device.



**11. Hydraulic production grinding machine** . . . for automatic grinding with grinding gage.

Artillerie-Inrichtungen, Hamburg, showed at Rotterdam a precision lathe with spindle speeds up to 10,000 r.p.m., specifically adjusted for machinability tests. The lathe slide had no mechanical



**12. New type of sintered carbide tip** . . . inserted at 45 deg. in steel shank, regrinding on rake and clearance face does not reduce hold in shank.

feed, but was fed by a weight over wires and pulleys, i.e. maintaining of constant pressure was possible.

Other photographs of machines seen at Continental Trade Fairs are shown in figures 7 to 12.

**The End.**

## Waldes Truarc Internal Grooving Tool

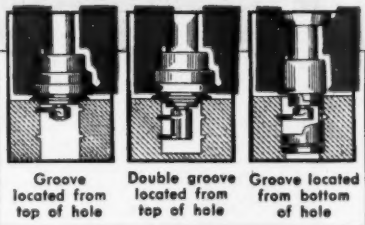
for precision cutting of internal grooves  
in bores and housings

**FAST! ECONOMICAL! NEEDS NO SKILLED LABOR!**



Internal groove-cutting becomes the simplest of operations with Waldes Truarc Internal Grooving Tool. Easy to adjust—easy to operate...readily adaptable to individual requirements.

Designed for use in any hand drill or automatic drill press and screw machine... assures a concentric recess without injury to metal. Operates by fingertip pressure—especially suitable for unskilled operators.



Groove located from top of hole

Double groove located from top of hole

Groove located from bottom of hole

The Waldes Truarc Grooving Tool when used in an electric or pneumatic hand drill, can be taken to the job eliminating disassembly and excessive handling...resulting in all-around savings in time and costs!



Write now for descriptive brochure giving mechanical details,  
cutting sizes...extra features

**WALDES**  
**TRUARC**

**GROOVING TOOL**

WALDES KOHINOOR, INC., 47-16 Austel Place, Long Island City 1, N.Y.

Waldes Truarc Grooving Tool  
Manufactured under U. S. Pat. 2,411,426

Waldes Kohinoor, Inc., 47-16 Austel Place  
Long Island City 1, New York MT-123

Please send me your descriptive brochure on  
Waldes Truarc Internal Grooving Tool.

Name

Title

Company

Business Address

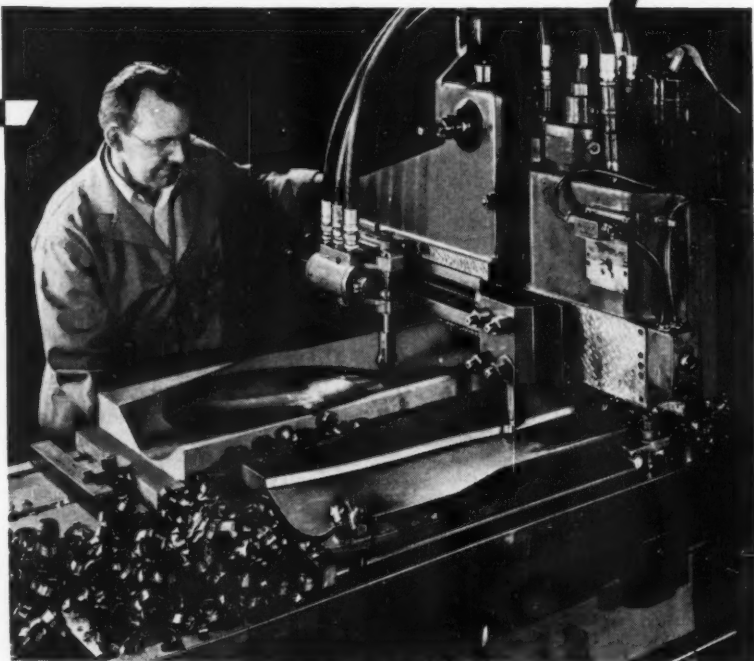
City  Zone  State

**KOPY-KAT**  
ROCKFORD MACHINE TOOL CO.

**DUPLICATES**

*Complex forms*

with ease of straight-production machining



*... on hydraulic shapers,*

*planers and slotters*

**DIRECT TRANSFER — NO INTERMEDIATE MOTIONS**

The Kopy-Kat is so sensitive, so exact, that positive duplication of complex forms is done with the ease of straight-production machining. Contours or full forms are produced, using inexpensive masters mounted on the cross-rail or table. A stylus transfers the form directly to the tool head through the patented hydraulic duplicator valve. Inaccuracies are eliminated by the absence of intermediate motions.

**FAST WORK — LESS COST** With the new Kopy-Kat you can turn out odd-shaped parts rapidly and economically for implements, aircraft, jet, turbine and other defense assemblies. Much time and money are saved with inexpensive masters, or by using the original form itself. Tooling and fixtures are greatly simplified.

Ask a Rockford Hydraulic representative to show you how the Kopy-Kat can simplify your form-machining problems. He can give you the complete story, with examples on many irregular mathematical curves and shapes.

For a quick picture send for Data Sheets No. 12.

**ROCKFORD MACHINE TOOL CO.**

2300 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

*Hy-Draulic*

519

**A special report  
by the editors of  
MACHINE and TOOL  
BLUE BOOK**

**Report number**

**17**

# **Gear Making Machines**

This is the seventeenth in a monthly series of special reports discussing various types of machine tools. Included in this month's special report on gear making machines.

1. Shot peening as a factor in the design of gears.
2. Descriptions of late model gear making machines.
3. Specifications of American-built machines.

Previously published reports discussed: 1. Thread Rolling; 2. Power Press Brakes; 3, 4, 5. Milling machines 6. Honing, Lapping, and Superfinishing; 7. Automatic Screw machines; 8. MAPI Replacement Formula; 9, 10. Chucking machines, Turret Lathes, Hand Screw machines; 11. Broaching machines; 12. Shapers, Slotters, Keyseaters; 13, 14, 15, Lathes; 16. Planers; 17. Gear making machines.

## **Shot peening as a factor in the design of gears**

**by John C. Straub**

Chief Research Engineer

American Wheelabrator & Equipment Corp.  
Mishawaka, Ind.

The greater the required horsepower per pound of transmission equipment, the more vital becomes the design of the gears which will be called upon to do the job. There is no intention of minimizing the importance of the other factors which go to make up a set of gears

with high load carrying capacity. Any significant shortcoming in forming the gear blanks, machining the teeth, control of material, heat treatment, etc. can completely nullify the advantages of an excellent design.

### Types of failure in gear teeth

Gear tooth failure may be grouped into three classifications.

1. Tooth breakage; in which an entire tooth or large portion of a tooth is broken out, is due to bending stress and is commonly known as a "fatigue" type of failure.
2. Pitting; is characterized by pits or small craters in the contacting surface of the tooth.
3. Scoring; sometimes referred to as spalling, scuffing or galling, is distinctly different from the first two mentioned and is evidenced by a decided roughness on the working tooth flank as though the mating surfaces had seized.

A pair of gears may be subject to any one or all of the foregoing types of failure, depending upon the type of service. In some cases this may result in a compromise between bending strength on one hand and scoring resistance on the other, because in some respects a design factor may favor one at the expense of the other. However,

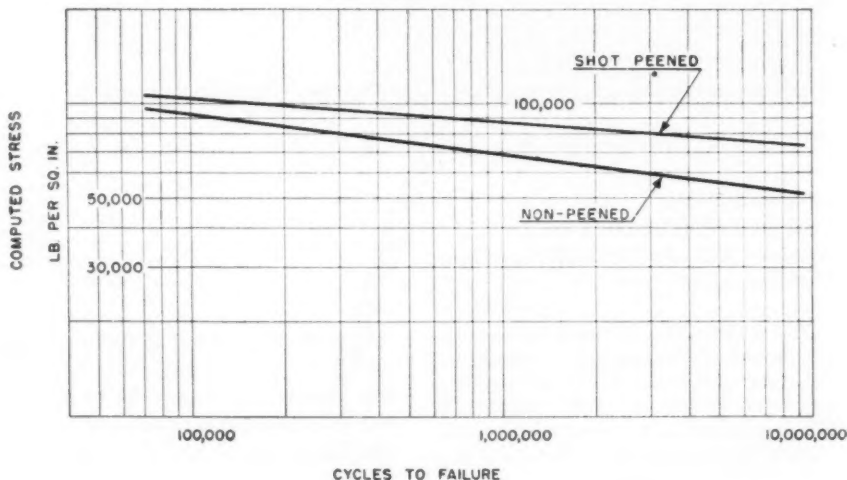
in highly stressed gears, scoring resistance may be increased by proper design consideration which utilizes greater bending strength. It should be mentioned that in highly stressed gears, that is, gears which are required to transmit high horsepower with a minimum of weight, a good design is not necessarily obtained by even the most careful study of the problem from the standpoint of pure mechanics and strength of materials.

### Shot peening for increased strength

In gears which are intended to carry high stresses, a pronounced increase in fatigue strength can be obtained by shot peening the teeth.

It is an established fact that shot peening is very effective as a means of increasing fatigue strength. Its effectiveness in overcoming fatigue failures in a given design of a machine part is well known. But its advantages in designing for greater fatigue strength and greater utilization of material are often

Figure 1



overlooked. The increase in allowable stress for a given fatigue life requirement will vary with that life requirement. That is, the greater the required life, the greater will be the benefit derived from shot peening. However, even under severe requirements, an increase of 10% in allowable stress is conservative.

The upper line of figure 1 shows the average life in relation to the calculated stress for shot peened carburized gears. In all cases, peening was for the last operation insofar as the teeth are concerned, and no attempt was made to protect the tooth flanks from the blast.

A chart similar to that of figure 1 was recently published by J. O. Almen which shows the lines for carburized gears, peened and non-peened at a somewhat higher stress. This is due to the fact that the lines in Almen's chart are chosen to represent higher quality of manufacture. The lines shown in figure 1 represent a conservative average of the same test data along with additional data accumulated by the author on carburized gears, peened and non-peened.

It can be seen from the chart that, for example, an average life of 800,000 cycles is obtained on non-peened gears at a calculated stress of 71,000 lbs. p.s.i. For the same average life, the allowable stress for shot peened gears is 88,000 lbs. p.s.i. or an increase of more than 24% in allowable stress.

Looking at the chart from the standpoint of increase in life at a given calculated stress, it can be seen for example that at a calculated stress of 80,000 p.s.i., the average life of non-peened gears is 300,000 cycles, and that of shot peened gears 3,000,000 cycles, or an increase of 1000% in life.

Shot peening is equally effective on gears of lower hardness as well as other types of gears such as spiral bevel, hypoid, etc. Sufficient data are not available for stress-life charts on the other

types but an increase of 10% in allowable stress is quite conservative.

In most cases, shot peening is the last operation insofar as the teeth are concerned. The slight roughening of the surface of the tooth flanks has no detrimental effect. Actually, some manufacturers feel that shot peened gears are more quiet running than non-peened gears of the same design and manufacture.

In some cases, however, it is desired to have a smooth finish on the tooth flanks. This can be accomplished by cutting the teeth with a protuberance hob, which produces an effect similar to undercutting at the root of the tooth. The gears are then hardened, shot peened and ground. This procedure allows the tooth flanks to be ground without removing any of the shot peened surface in the fillet where the bending stress is maximum.

### Pitting resistance

Data on pitting resistance are not as plentiful as in the case for bending



"Kowalski always has trouble getting his eyes open in the morning."

strength, primarily because of the difficulty in obtaining quantitative data. Bending failures can be easily recognized while the gears are running, because of the sudden noise. Pitting on the other hand is a very slow and progressive failure starting with extremely small craters in the tooth profile. In some cases these craters grow larger and more numerous until finally sufficient material is removed that complete failure results. In other cases it may develop as very small pits which progress to a moderate degree and then stop without any real damage.

Wickendon, Brophy and Miller have been successful in establishing some quantitative data, and in determining the life of gears at which pitting begins. These tests were run on a special test machine designed to minimize variables in testing. It is to be hoped that such tests will add appreciably to the information now available on pitting.

### Scoring resistance

Scoring is caused by a combination of high compressive stress and high sliding

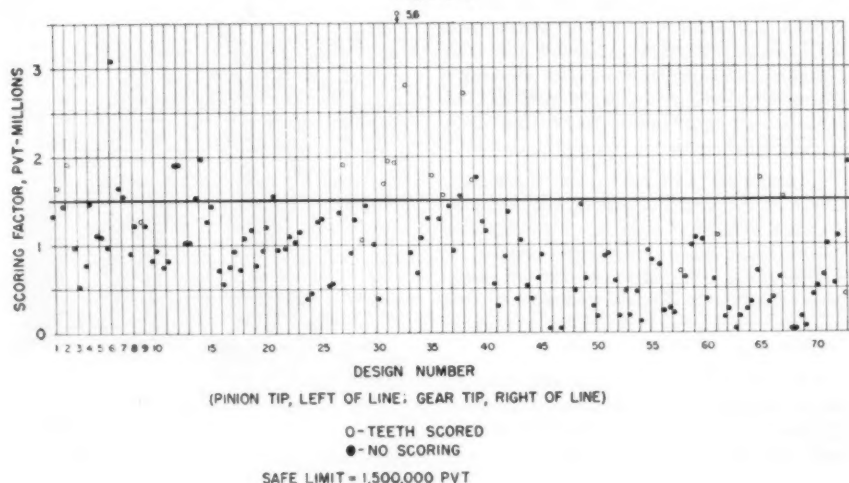
velocity on the contacting tooth surfaces. By means of an approach similar to that described above in appraising the bending strength formula, a method of calculation of scoring resistance in spur and helical gears was developed by the author, under the direction of J. O. Almen at the Research Laboratories Division, General Motors Corp. Dynamometer test data were accumulated on a very large number of gears, along with the complete design information. With these data at hand, various assumptions were made until good correlation was obtained between calculated values of scoring resistance and the actual test data.

Briefly, the method selected is based upon the same assumption, with regard to distribution of the transmitted load, as that used in the bending strength calculation discussed above.

The method consists of the calculation of the product "PVT."

"P" is the maximum compressive stress as determined by the Hertz equation for cylindrical surfaces, for a point

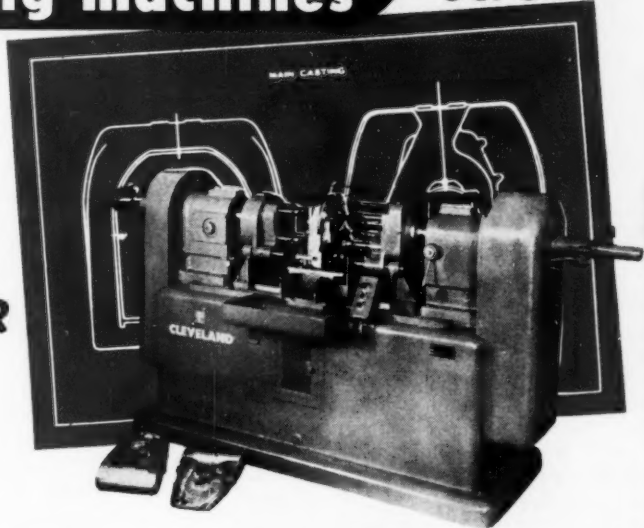
Figure 2



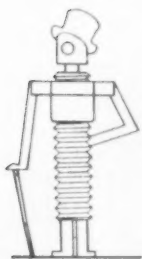
# CLEVELAND tapping machines

lead  
screw

**300  
PIECES  
PER HOUR**



## BOTH SIDES TAPPED IN ONE OPERATION



Mr. Lead Screw says...Write for your copy of the Cleveland Production Tapping Guide and a copy of Catalog MB-4

For a leading appliance manufacturer Cleveland engineers designed a Cleveland Tapping Machine to tap four 10-24 and one 6-32 holes in the top face of the main casting and five 10-24 and two 8-32 holes in the bottom face . . . both sides simultaneously all with lead screw controlled spindles to assure complete accuracy. On needed civilian and on defense jobs Cleveland Tappers are reducing production costs and saving priceless man hours. With a Cleveland Tapper engineered to the job, a semi-skilled worker becomes a skilled operator.

**CHECK WITH CLEVELAND FIRST** if you need to perform any or all of these operations: Tapping . . . Threading . . . Drilling . . . Spotfacing . . . Reaming . . . Chamfering. Cleveland engineers can help you with your problem, show you how to effect economies in these operations.



**THE CLEVELAND TAPPING MACHINE CO.**  
A Subsidiary of AUTOMATIC STEEL PRODUCTS, INC.  
CANTON 6, OHIO



located at the tip of the gear tooth or pinion tooth, and based upon the total tooth load derived from torque, the average total length of lines of contact, and the curvatures of the tooth surfaces in the plane normal to the line of contact at the selected point.

"V" is the sliding velocity of the surfaces at the selected point.

"T" is the distance in the plane of rotation from the pitch point to the selected point.

The degree of correlation of the calculated values with actual test results can be seen from the chart of figure 2.

The data shown in this chart represent actual test results on well over 50,000 pairs of aircraft gears. The gears tested covered a wide range of requirements. The torque requirements varied from a few foot pounds up to several thousand foot pounds, and the speed requirements ranged from a few hundred rpm up to 28,000 r.p.m. All of the test data accumulated were on fully hardened spur gears, lubricated with mineral oil. External as well as internal gears are included.

Note that, by and large, those gears which have a calculated PVT factor in excess of 1,500,000 failed by scoring, whereas those with a PVT factor of less than 1,500,000 had no scoring failure. There are a few exceptions, but not without reason. For example, point No. 6 represents a gear in a high ratio pair in which, with a true involute profile, tooth action would have taken place very close to the base circle, resulting in a high compressive stress, along with high sliding velocity. The calculated PVT factor would indicate scoring failure. However, in this case, the gears were made with a pronounced profile modification at the tip of the gear teeth, thus decreasing the actual compressive stress in that region. It should be mentioned, however, that this particular design was studied and it was found that

a PVA factor of less than 1,500,000 could have been obtained by decreasing the gear addendum and correspondingly increasing the pinion addendum, without tooth profile modification. The two points which show scoring failure at a low PVT value were in planetary units with a large number of planetary pinions. In both bases, the load was assumed to be distributed equally among the pinions which is probably erroneous. Assuming fewer pinions carrying the load, the PVT factor would exceed the safe limit of 1,500,000.

It should be mentioned that with extreme pressure lubricants, a value of PVT in excess of 1,500,000 may be used.

### Balanced design with shot peening

A study of the design considerations from the standpoint of both bending strength and scoring resistance reveals that there is some conflict between high bending strength on the one hand and

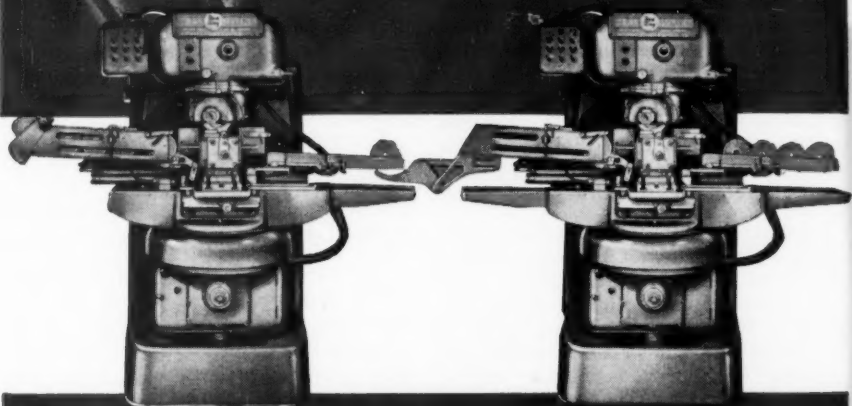


"Ever since we got the government contract he's been hanging around to see that we do it right."

## RED RING Straight Line Automatic Loader

Saves Time and Conserves Manpower

In Shaving Cluster Gears



This new Red Ring Loader puts the shaving of cluster gears on a continuous automatic basis with important savings in time and manpower.

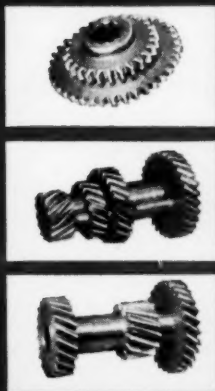
Although the illustration shows a battery for shaving a two step cluster, additional machine units may be added for as many additional steps as necessary.

All machines in such a battery are synchronized, but each unit is individually controlled and may be individually operated when desired. Each incorporates the universally accepted crossed axes principle of shaving.

A single operator is needed merely to supply unshaved gears to the magazine feed of the first machine and to remove the completed gears from the discharge chute of the final machine. All handling between machines is done by the automatic mechanical transfer mechanisms. All operations are in full view of the operator at all times.

*Write for full description and savings.*

SPUR AND HELICAL  
GEAR SPECIALISTS  
ORIGINATORS OF ROTARY SHAVING  
AND ELIPTOID TOOTH FORM



**NATIONAL BROACH & MACHINE CO.**

3600 ST. JEAN ..... DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

high scoring resistance on the other. For example, according to the formulae, a coarse pitch is desirable for bending strength because of the greater thickness at the root of the tooth. However, in some cases this would be impractical because a coarse pitch would necessitate long teeth for continuous action. This, of course, would mean an increase in the length of action, and consequently higher sliding velocity. Furthermore, with long teeth, particularly in high ratio gears, tooth action approaches the base circle of the pinion which in turn results in a high compressive stress because of the small radius of curvature of the pinion tooth in that region. In such a case, an increase in bending strength may lead to scoring tendencies.

Therefore, in order to obtain satisfactory operation with minimum weight, it may be necessary to compromise between bending strength and scoring resistance. This leads to a logical question as to the usefulness of shot peening relative to scoring resistance. For a given design, experience indicates that shot peening has little direct influence

on the scoring tendency of gears of the same design and operating conditions. However, since a balanced design may involve a compromise between bending strength and scoring resistance, a distinct advantage can be taken by designing the gears with a finer pitch in favor of scoring resistance. This would result in decreased bending strength which can be restored by shot peening. By this reasoning it can be seen that shot peening can be used directly for increasing bending fatigue strength, or indirectly, by proper design consideration, for increasing scoring resistance.

The preceding article is a condensation of a recent paper contributed by the Machine Design Division for presentation at a meeting of the American Society of Mechanical Engineers.

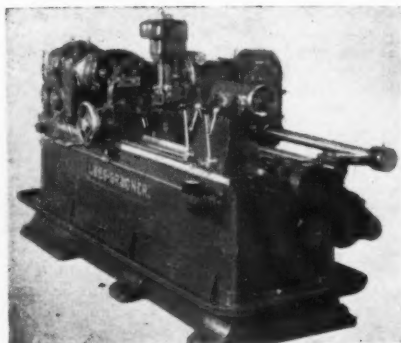
The author is grateful to J. O. Almen of the Research Division, General Motors Corp., and to A. H. Candee of the Gleason Works for valuable suggestions and helpful criticisms during the preparation of this paper.

**The End**

## **Part 2. Descriptions of late model gear making machines**

### **Lees-Bradner spline and gear hobbing machine**

The Model SH horizontal spline and gear hobbing machine is a recent development of The Lees-Bradner Co., Cleveland 11, Ohio. This unit is recommended especially for the accurate generation of long, continuous splines. The machine is available in four lengths, to produce splines up to 102" continuous length in one cut, or longer lengths, if desired. Although intended primarily for producing straight or helical splines, spur and helical gears can also be hobbled on the Model SH.



Designed with a maximum hobbing capacity (4" hob) of 8¾" diameter, the Lees-Bradner machine has six hob speeds ranging from 72.5 to 145 r.p.m. Its equipment includes change gears for indexing 4, 5, 6, 8, 10, 12 and 16 teeth, plus six feeds of from .015" to 125"; a set of cutter speed gears, a motor driven coolant pump, piping, wrenches, a work-spindle center and adapter, a tail stock center, 6" diameter collet arranged for pads, and a 6" diameter capacity follow rest with adjustable jaws. Floor spaces for the four Model SH machines are 41" wide x 6½' long up to 13' long.

### **Hamilton hobber features rapid gear generation**

A gear hobber which is stated to be ideal for more rapid generation of precision spur, spiral and bevel gears, gear sectors, spline shafts, pinions and worm gears, is the No. 1 Gear Hobber made by The Hamilton Tool Co., Hamilton, Ohio.

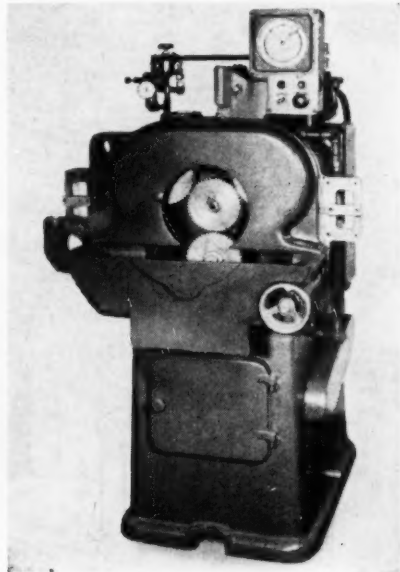
This unit stresses extreme accuracy as well as high speeds in its operation. It will generate gears from .050" to 6" outside diameter; in spiral gears, both right

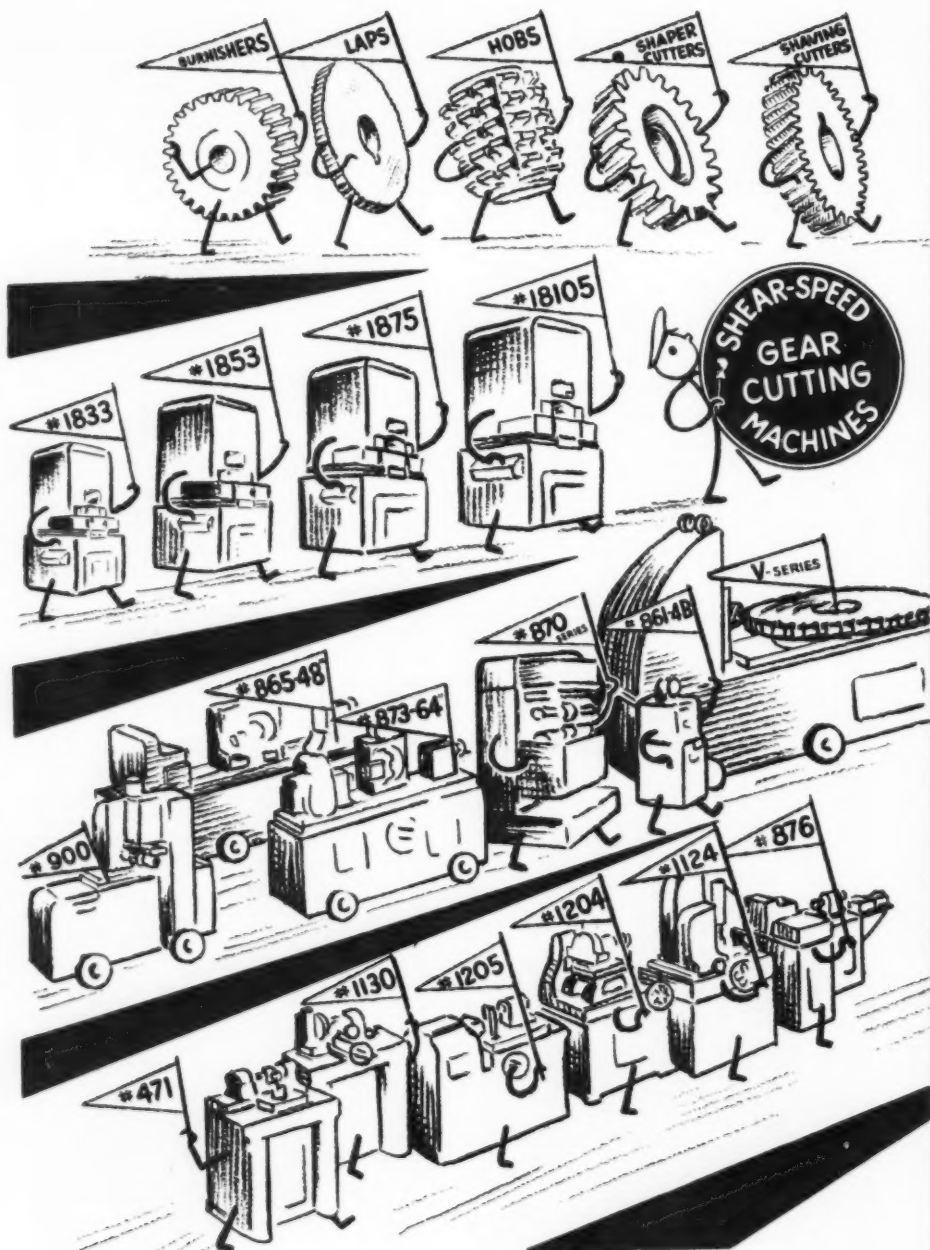
and left hand pitch. It operates for both climb hobbing as well as conventional hobbing. Twelve hob speeds ranging from 109 to 1259 r.p.m. are available. The Hamilton machine will hob any number of teeth between 6 and 130, any even number of teeth between 130 and 260. The helix leads are from .800" to 130".

The speeds, feeds and indexing can each be selected independently. This feature, plus the wide range of hob speeds, adds flexibility to the unit and enables quick selection of a speed and feed to suit any material being worked on as well as any size gear which is being hobbled.

### **Fellows LS-type gear lapping machines**

These machines, manufactured by The Fellow Gear Shaper Co., Springfield, Vt., are stated to furnish a practical means of gear finishing after heat treating. They employ two methods: three helical gear-type laps for lapping external helical gears (see illustration); a detachable head which is used in







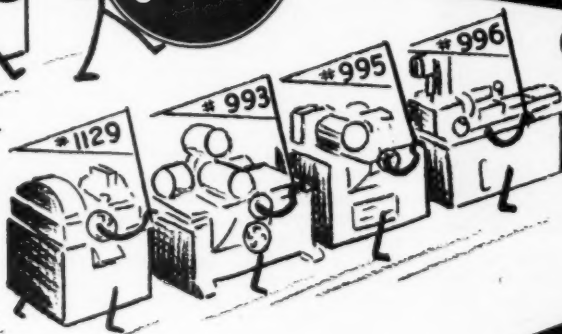
GEAR  
CUTTING  
TOOLS



GEAR  
SHAVING  
MACHINES



GEAR  
& TOOL  
CHECKERS



LAPPERS  
&  
SPEEDERS

# MOBILIZED!

## to solve your gear problems

... whether your gears are large or small ( $\frac{1}{4}$ " to 14 ft.): You'll never need all this equipment. But, as specialists in the science of spur and helical gear production, Michigan Tool has to make and build all (\*) of these machines and tools ... for the simple reason that:

**No one step in gear processing is independent of other steps**

**No one type of equipment is best suited to EVERY production setup**

With its staff of gear production specialists—familiar with EVERY step in gear processing—backed by a complete line of equipment which we KNOW will do the job—Michigan Tool can give you not only *better* gears, but *more* of them ... per man-hour and per dollar invested.



7171 E. McNICHOLS RD. • DETROIT 12, MICHIGAN, U. S. A.

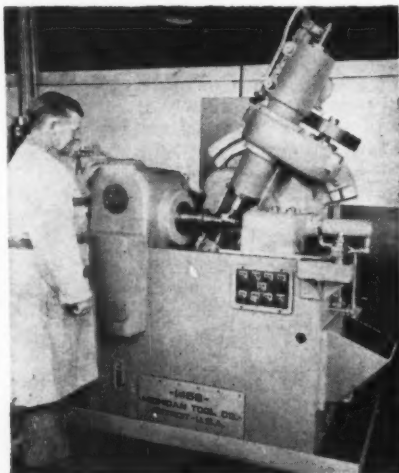
(\*) plus some omitted for lack of space.

lapping external and internal spur and helical gears.

The outstanding features of the LS series include an adjustable and automatic time control; a positive guide control for work reciprocation of the gears; an independent lap adjustment for correcting the lead or distorted axial alignment of gear teeth; the compound is pumped to the gears and laps with provision for suitable amount, irrespective of the speed of rotation of the work; air brakes on the lap spindles; and independently adjustable rotative and reciprocative speeds. Ten different models, including all standard features are included in the Fellows LS line of gear lapping machines.

### **Michigan gear hobber, Model 1458**

A new gear hobbing machine which can turn out a wide variety of standard pitch gears in close tolerances in a relatively short period, is the Model 1458, introduced by Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich. This unit was designed to meet certain operating characteristics now heretofore available.

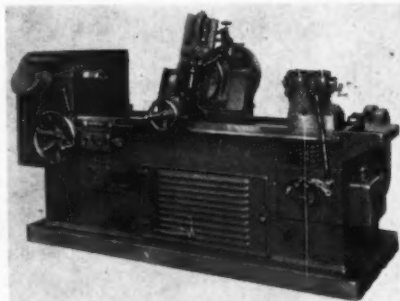


Two separate feeds are used in sequence, a plunge feed to correct depth by the hob, with its center line just 1/16" ahead of the work, followed by a

transverse feed of the work across the hob to a point 1/16" past center to complete the cut. This machine is stated to be smooth and vibrationless at all speeds. It will hob gears up to 8" diameter down to 2½". The hob diameter and hob length capacities are both 7". This horizontal single spindle machine is equipped with infinitely variable hydraulic control of the feeds. Spindle speeds up to 1000 r.p.m. or more are provided. The maximum swing of the hob spindle is 35° either side of center.

### **Adams gear hobber and thread miller**

The No. 5 Gear Hobber and Thread Miller, made by The Adams Company, Dubuque, Iowa, is essentially a precision machine which is recommended for gear-using industries. It is designed

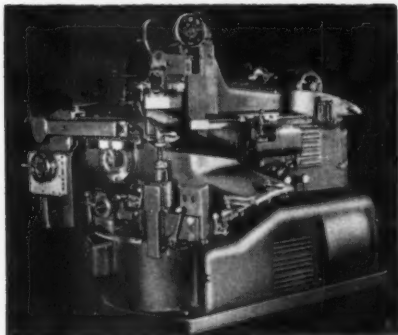


primarily for the rapid and economical production of long splined shafts and for milling long screws. It is also stated to be highly productive in the milling of worms and the hobbing of small spur and helical gears, either bored or integral with shaft.

The bed is a semi-steel casting of heavy box type construction. The motor is in the base of the unit. A multiple disc clutch, mounted on ball bearings and operating in oil, provides a smooth, flexible drive. A sliding gear transmission furnishes a selection of eight spindle speeds of from 50 to 250 r.p.m. with an 1160 r.p.m. motor. The feed gears are housed in an end compartment of the machine; 47 feeds are provided per revolution of the work spindle, ranging from .0075" up to 1.500".

### P & W hydraulic gear grinder

The 10" hydraulic gear grinder for spur and helical gears is a product of Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford 1, Conn. The operating principle is simple, consisting of a reciprocating horizontal



ram, similar to that of a horizontal shaper, which carries the grinding wheel back and forth through the teeth, generating the adjacent sides of two teeth at once. The wheel is trued with straight sides and top, corresponding with the shape of a tooth in a master rack. The gears being ground are rolled past the reciprocating wheel under the guidance of a master gear and rack, so that the wheel always engages the work tooth for tooth, as the master rack engages the master gear.

Power for this 10" gear grinder is supplied by two motors—a 2 h.p. motor is carried on the ram, and drives the wheel spindle through two v-belts; spindle speeds of 2215 and 2500 r.p.m. are provided; the other is a 5 h.p. motor mounted under the cover on the side of the bed, direct connected to a duplex oil pump. This motor supplies the power for the entire hydraulic system. A separate motor driving a centrifugal pump supplies coolant to the work.

### Geargrind spline grinders

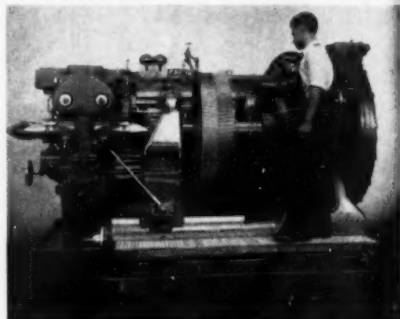
Two new spline grinders, the Geargrind Type SG-10 x 24A and Type SG-10 x 48A are made by The Gear Grinding Machine Co., 3901 Christopher St., Detroit 11, Mich. Twin grinding wheel

head, are mounted on the base. A carriage, sliding on ways on the base, carries the work, which may be mounted either between centers of the index head and tailstock or on a stub arbor mounted in the index head. A master index plate governs the tooth spacing.

The work reciprocates past the grinding wheel on a short stroke, sufficiently long to clear the grinding wheel from the cut; at each reversal point, the grinding wheel feeds down. Grinding on one tooth space continues until a "rough size" is reached; then the work travels on an extended stroke so as to clear the grinding wheel to permit indexing of the work and resetting of the grinding wheel head.

### Farrel-Sykes gear generators

The Farrel-Sykes Gear Generators are now available in five models, from Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo 7, N.Y. These units are designed to provide extreme precision with high speed operation in the generation of gears of all types which operate on parallel axis. These versatile units provide for the generation of gears of from 12" up to 61" diameter (max.). Models are equipped with 4 1/8" hole in spindle on the Model 1A up to 9 1/2" on the Model 5B.



The wide range of these Farrel-Sykes machines includes continuous tooth double helical gears, single helical gears with external or internal teeth, spur gears, either with staggered or internal teeth, cluster, angle and spiral gears, worms and racks, sprocket wheels, reamers, cams, and a variety of special contours.

# WHAT THE EVOLUTION OF WALES HOLE PUNCHING & NOTCHING EQUIPMENT

*means to You!*

● The evolution of this equipment not only provides the most complete line of STANDARD hole punching and notching equipment in America, but has revolutionized tooling practice by *astoundingly reducing tooling costs and time.*

Before the availability of Wales Equipment, it was necessary to design and custom-build a completely new "fixed" die for each pattern with special punches and punch plates, special stripper plates, special die buttons and die plates. NOW . . . a group of Wales independent, self-contained Units may be set up in unlimited patterns and put into operation the same day a pattern is released for production. Setting up Wales Equipment is a simple assembly operation. *No aligning of punches and dies.*

After a pattern has been run, the same group of Wales Units may be used and reused in other patterns on stamping presses and press brakes eliminating "dead storage" of set-ups and tooling investments by keeping them in practically continuous operation.

There's always something new in the Wales Line, so write TODAY for your copies of fully-illustrated, functionally-colored Wales Catalogs.

## WALES - STRIPPIT CORPORATION

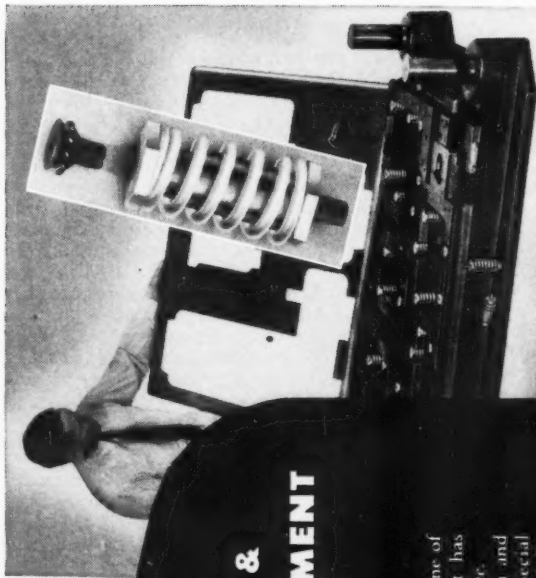
— GEORGE F. WALES, Chairman

396 PAYNE AVE., NORTH TONAWANDA, N. Y.

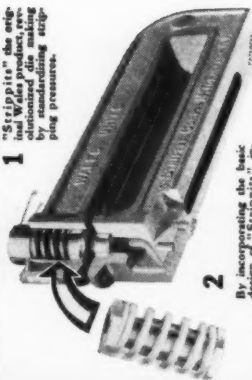
*Incorporated in New York State*

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONTARIO

*Specialists in Punching and Notching Equipment*



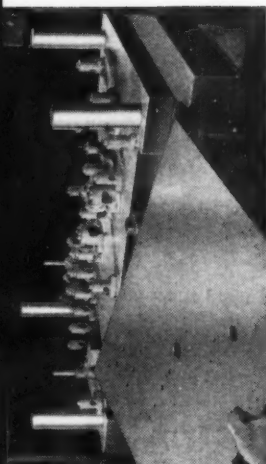
1 "Stripplit" the original Wales product, revolutionized die making and stamping equipment pressure.



2 By incorporating the basic design of "Stripplit", the new Wales Type "BL" Hole Punching Unit became a reality.



**4** Above is a combination set-up of Wide Type "BL" Hole Punching Unit and Type "NJ" Notching Unit for punching and notching steel up to  $\frac{1}{2}$ " thick. Note the punched and notched work in foreground.

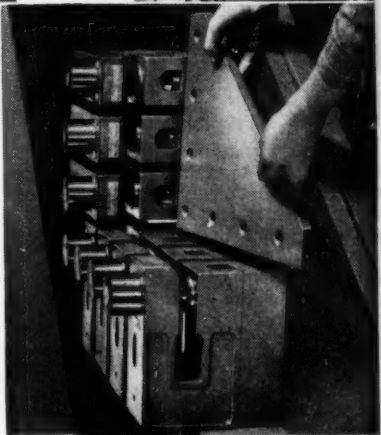


**5** Wide Type "CD" Hole Punching Unit in operation in stamping press for punching mild steel up to  $\frac{1}{2}$ " thick.

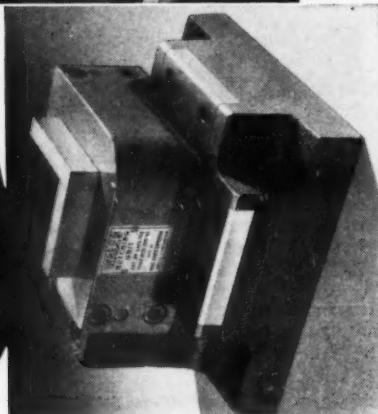


**8** Wide Type "8B" Hole Punching Unit for punching angles, channels and extrusions up to  $\frac{1}{2}$ " thick. Showing 3 press brakes in line punching holes in stringers up to 40 feet long.

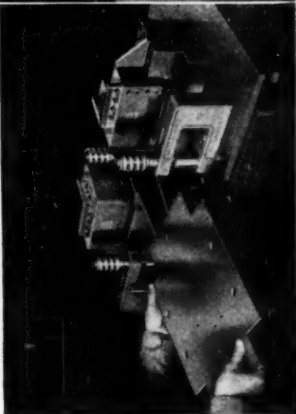
**7** Wide Type "CG" Hole Punching Unit for punching mild steel up to  $\frac{1}{2}$ " thick.



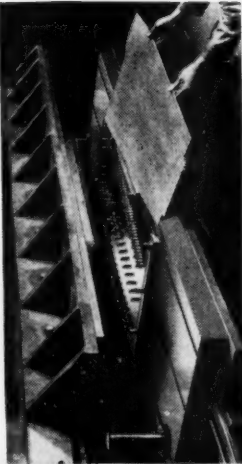
**3** Wide Notching Units were a natural outgrowth of the successful applications of Wales Hole Punching Equipment and basic principle of Wales "Strippage".



**6** A combination set-up of Wide Type "NJ" Notching and Type "CJ" Hole Punching Unit punching and notching mild steel up to  $\frac{1}{2}$ " thick.

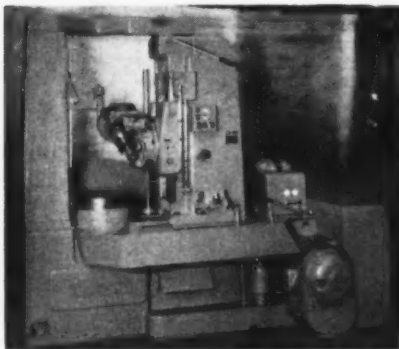


**9** Wales Multiple Hole Punching System for simple, fast, convenient and economical punching sheet metal parts up to  $\frac{1}{2}$ " thick mild steel.



### **G & E universal gear hobbers**

A complete line of universal gear hobbing machines is manufactured by Gould & Eberhardt, Inc., Irvington 11, N. J. The model 24H, illustrated, is stated to be especially useful for hobbing a wide variety of gears used in trucks, tractors, small speed reducers and machine tools.



The construction of the hob spindle in all G & E machines is different from conventional designs; a tapered bronze sleeve is shrunk on the heat treated spindle, which rotates within a stationary hardened brush. The spindle has a reverse-taper bearing, with a small diameter of the taper at the nose end of the spindle, to permit more closely supporting and driving small-diameter hobs.

All hobbers are arranged for climb hobbing in addition to the conventional downfeed method of cutting. When climb hobbing the feed is upward and the hob rotates top coming. Rapid traverse for approach and return is also available when climb hobbing.

### **Gleason hypoid gear rougher and finisher**

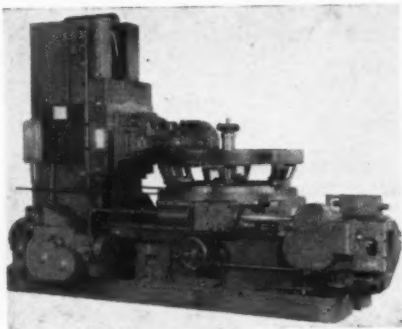
A group of hypoid gear finishing machines commonly used for automotive work are the No. 11 Gear Rougher and the No. 16 Gear Generator, made by the Gleason Works, 1000 University Ave., Rochester 3, N.Y. The gear of a hypoid pair resembles a spiral bevel gear in that it has conical shape and curved, oblique teeth; it is used for transmitting

power and motion around a corner. The axis of the pinion of the hypoid gear is off-set below or above the axis of the gear itself, differing from regular spiral bevel gear in this respect.

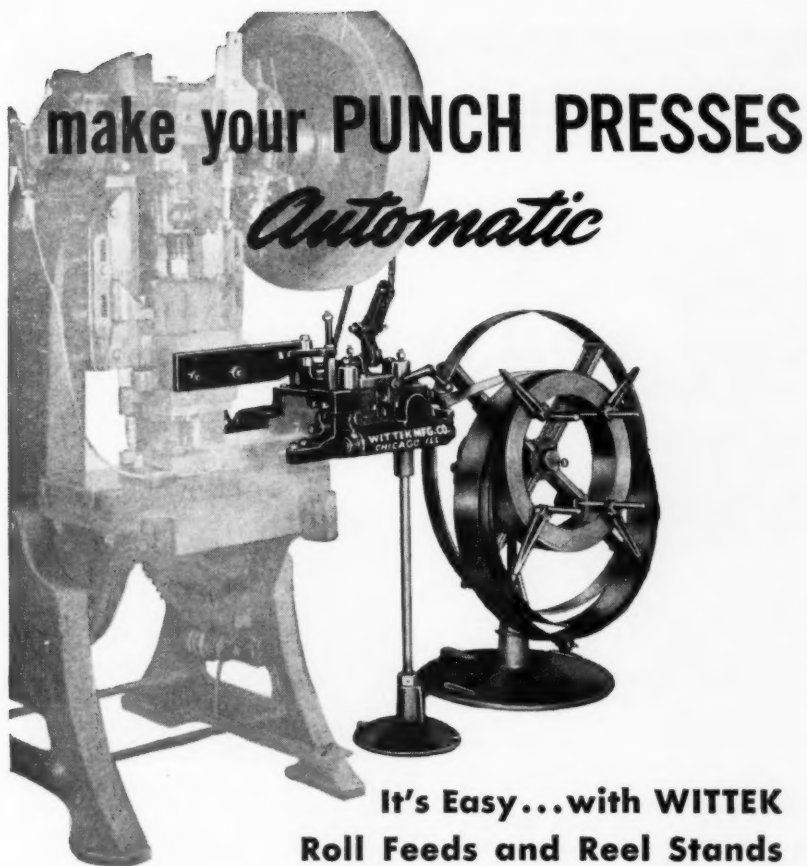
The work spindle on these Gleason machines can be placed above or below the center. This off-set adjustment can also be used on certain spiral bevel pinions. In addition to being used for generated gears, the Model 16 is used most widely for both hypoid and spiral bevel pinions.

### **Newark spur gear cutters**

The model 84VG vertical spur gear-cutting machine is manufactured by Newark Gear, Inc., 69 Prospect St., Newark 5, N. J. This unit has a work diameter for external gears of 90", and a maximum work diameter with outside support column of 40". The face capacity for work 40" diameter or smaller, cutter travel is 22"; for work over 40" to 90" diameter, cutter travel is 32". The work table is 42" in diameter, with a 12" diameter hole, permitting solid pinions to go through the table and bed.



Standard equipment for the Newark spur gear cutter includes indicator for setting cutter; indexing change gears to cut all numbers from 4 to 500, excepting prime numbers above 100 and their multiples; speed and feed gears, one 1½" and one 2" cutter arbor; one size straight work arbor, with collars and pair of stepped flanges, work-drivers and height-blocks for work table, etc.



# make your PUNCH PRESSES

## *Automatic*

### It's Easy...with WITTEK Roll Feeds and Reel Stands

Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions.

Wittek Reel Stands facilitate handling coiled stock.

Write for full particulars

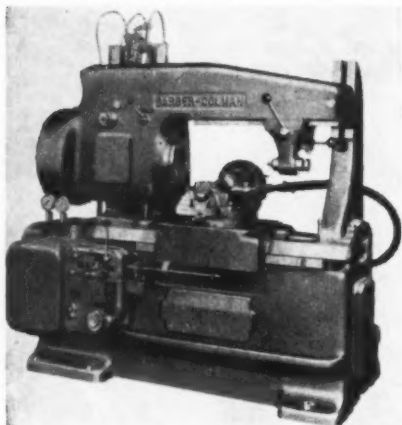
**WITTEK** Manufacturing Co.

4321 W. 24th Place, Chicago 23, Illinois



### **Barber-Colman production gear hobber**

The Model 14-15 horizontal production gear hobbing machine is a recent introduction of Barber-Colman Co., Rockford, Ill. This unit is designed for



high production with extreme accuracy of spur and helical gears, splines and other forms. It features an automatic hydraulic cycle, climb or conventional hobbing, built-in differential, extreme power and rigidity, a central control panel and off-set outboard support for long shafts. Standard equipment includes motors, electrical controls, accessories, speed change gears for 8 speeds, index and lead gears for one set-up, and interchangeable hob spindle.

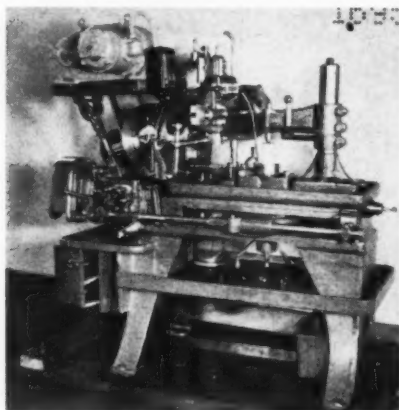
This Barber-Colman machine is applicable for roughing, semi-finishing or finishing of gears, as well as for heavy-duty, high production hobbing to close limits of accuracy. It is stated to be suited to long runs and carbide hobbing on non-metallic gears. The unit has flexibility for a range of work varying from heavy coarse-pitch gears to spline shafts.

### **Whiton automatic gear cutting machine**

This automatic gear cutting machine is manufactured by The Whiton Machine Co., New London, Conn. It is stated to be easy to set up, accurate and

versatile. On production work it can be used for either roughing or finishing, and is said to be particularly adaptable to the various gear requirements arising in machine shops.

The Models 14 and 16 Whiton machines have a capacity of 32" and 29½" bevel gear diameter, respectively, and a capacity of 34" and 31½" spur gear diameter, with 7" face in both models. The cutter spindle speeds of these machines are from 52 to 156 r.p.m. on the No. 14 and 35 to 105 r.p.m. on the No. 16. Exclusive features include a stop motion for interrupting the automatic



action of the feeding, reversing and spacing mechanisms, and an alarm for sounding upon the completion of any desired number of teeth.

### **Bilgram bevel gear generators**

Two bevel gear generators, a 6" size and a 16", are manufactured by Bilgram Gear & Machine Works, Inc., 1217-35 Spring Garden St., Philadelphia 23, Pa. All machines are equipped to cut involute teeth of either 14½° or 20° pressure angles, but with a slight change in adjustments, other pressure angles within certain limits can also be cut. All machines will cut either straight or spiral teeth.

The "Bilgram Feed Box" incorporated within these machines makes possible the acquisition of 15 different feeds of the generating head. Machines are elec-

# Your AGD Adjustable Limit Snap Gage becomes an Indicating DIAL Snap Gage

WITH THE



## Dializer

**YES . . .** by simply fitting **STANDARD Dializers** to your present AGD Adjustable Limit Snap Gages (Models A, B or C) you can convert them to Dial Indicator Snap Gages!

You will gain all the advantages of indicating instruments at considerable saving in cost!

**DIALIZER** easily installed or transferred from one frame to another.

**RANGE OF ADJUSTMENT** of gage is unaffected.

**ACCURACY ASSURED** by double reed principle.

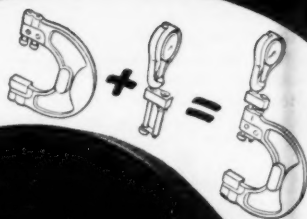
**INDICATOR** furnished with either .0001" or .001" graduations.

### POPULAR ACCEPTANCE

Repeat orders are good evidence of practicality and tested-in-use value. Write for prices. Be sure to specify size and quantity.

\*Patent Applied For

## STANDARD GAGE CO., Inc. Poughkeepsie, N.Y.



**SIZES TO FIT ALL  
AGD Adjustable  
Limit Snap Gages  
(Models A, B or C)**

**Dializer No. 1**

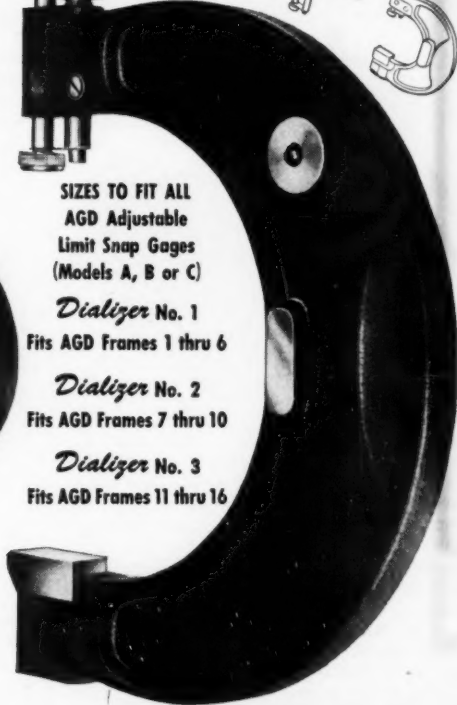
**Fits AGD Frames 1 thru 6**

**Dializer No. 2**

**Fits AGD Frames 7 thru 10**

**Dializer No. 3**

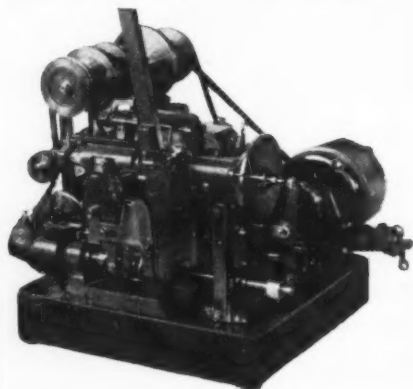
**Fits AGD Frames 11 thru 16**



trically driven through an infinitely variable speed drive, making possible a wide speed range of the shaper unit. These units automatically index to the next tooth after each stroke of the shaper ram, minimizing possibilities of local heating of the blank, and assuring teeth of absolute uniformity.

### **Pinion and gear cutting machine**

A line of bench-type pinion and gear cutting machines is manufactured by Waltham Machine Works, Waltham, Mass. These units are designed for fine pitch mechanisms, such as are used in watches, instruments, etc., except that they have greater weight and capacity than is customary in such machines.



The same patterns are used for the castings of all the several types that are available. All types use the same process, consisting of a revolving cutter which makes successive cuts on blanks held and indexed by the work spindle and usually supported by a tail center. Only straight teeth can be cut.

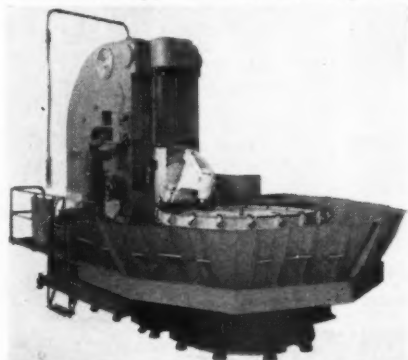
The cutter spindle is designed for high speeds. The end-thrust is at the front of the front bearing and is only about 1" from the finishing cutter. The driving pulley revolves on a stud which serves as a pivot for the swinging spindle housing. The connection to the cutter spindle is through helical gears. The diameter of the work is determined

by a screw positioned about twice the distance from the pivot, as is the spindle.

### **Red Ring gear shaver**

A Red Ring gear shaving machine for both internal and external spur and helical gears with face widths up to 40" and pitch diameters up to 100" has been introduced by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. With this unit, shaving is accomplished by the rotary crossed axes principle, with the work gear driving the cutter, as is customary in shaving gears larger than 24" pitch diameter.

The general design includes an independently driven rotary work table and a column which moves horizontally, carrying the cutter head to, and feeding it into the work. The cutter head reciprocates in its vertical slide across the face of the work. The column, which carries on its forward end the cutter head assembly, moves horizontally and



is supported throughout its full travel on hardened and ground slide ways in the machine base. The approximate bearing pressure on these ways is 15 lbs. p.s.i.

### **Reports in preparation**

Special reports on machine tools now in preparation include: grinders, boring mills, drilling machines, etc. These, and others, will appear in future issues of the MACHINE and TOOL BLUE BOOK.

# JIG GRINDING ACCURACY *guaranteed\**



## INFINITE CONTROLLED SPEEDS 30,000 TO 65,000 R. P. M.

### *Easily connect jig grinder to jig borer or mill*

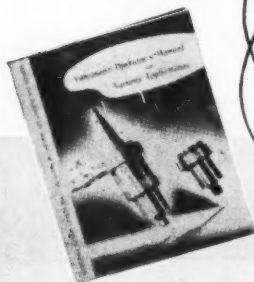
Then you can finish grind in hardened steel to "tenths" . . . jig grind dowel holes square with a ground base . . . move location of holes in hardened steel blocks . . . jig grind interchangeable holes in hardened sections . . . grind small holes with diamond impregnated mandrels . . . grind contours and relief with tungsten carbide burrs . . . grind radii in die sections . . . eliminate jig bushings in tools where close spacing is essential.

*\*Dependably accurate to "tenths"*

### *Other infinitely controlled air driven spindle applications*

Place spindle on most any machine. Use it for finishing contours on hardened steel working surfaces . . . burring or milling die castings . . . routing wood contours . . . carbide milling or finishing slots . . . finishing holes in hardened steel to "tenths" . . . grinding with diamond wheels, carbide burrs, or diamond impregnated mandrels.

*Advantages*—10 micro finishes using carbide mills . . . 5 micro finishes using mounted points, operates at any angle . . . air driven, air cooled, overheating prevented . . . speed controlled at optimum point . . . 3 3/4" long motor uses little working space . . . By controlling speed at any point you abolish need for many constant speed spindles.



For immediate quotation please state machine tool application. Get this manual of photos showing operations Vulcanaire performs.

# *Vulcanaire*

BUILT BY TOOLMAKERS FOR TOOLMAKERS

VULCAN TOOL CO.,

HIGHLAND & LORAIN

DAYTON 10, OHIO

## Part 3. Specifications of American-built Gear machines

National Broach & Machine Company			Detroit, Michigan	
Type and Model	Pitch Diameter	O.D. and D.P.	Work Table Max. Length W=With crowning WO=Without crowning	Distance Between Headstock and Tailstock Centers
<b>Fine Pitch Gear Shaver</b> GCL3	$\frac{1}{4}$ " to 4"	4.10" and 20 to 60 D.P. (and finer)	6" to $\frac{1}{4}$ " travel; 4, 6, 8 strokes per cycle; table feed is variable	5 $\frac{1}{2}$ " Max.
<b>Gear Shaving</b> GCL-8"	1"-8" external; 3"-8" internal	DP=4	W=18 $\frac{1}{2}$ "; WO=28"	Face width: 12" straight shaving; 6" crown shaving
GCL-12"	1"-12" external; 3"-12" internal	do	W=18 $\frac{1}{2}$ "; WO=27 $\frac{1}{2}$ "	do
GCL-18"	2 $\frac{1}{4}$ "-18" external; 3"-18" internal	DP=3	do	do
GCP-24"	3"-24" external; 6"-24" internal	DP=2	W=30"; WO=30"	Face width: 10" straight shaving; 6" crown shaving
<b>Diagonal Shaving Machine</b> GCU-8"	1"-8"	8 $\frac{1}{2}$ " O.D. 4-16 D.P.	4" table stroke	Max. Dist. between centers=24"
GCU-12"	1"-12"	12 $\frac{1}{2}$ " O.D. 4-16 D.P.	do	24"
<b>Gear Shaving</b> 36"	4"-36"	38" O.D. 1 D.P.	36" shaving stroke	62" std. up to 160" available
48"	4"-48"	50" O.D. 1 D.P.	do	do
96"	24"-96"	97" O.D. 1 D.P.	111" shaving stroke	125"
120"	48"-120"	121" O.D. 1 D.P.	do	125"
100"	This newest gear shaving machine, recently announced, is designed for shaving internal and external spur and helical gears with face widths up to 40" and pitch diameters up to 100".			

Whiton Machine Company		New London, Connecticut		
Type and Model	Face	D.P.	Capacity B=Bevel Gear Dia. S=Spur Gear Dia.	Spindle Speed and Horse Power
<b>Automatic Gear Cutter</b> No. 14	7"	6 cast iron; 7 steel	B=32"; S=34"	52-156 r.p.m. 1 $\frac{1}{2}$ h.p.
No. 16	7"	3 cast iron; 4 steel	B=29 $\frac{1}{4}$ "; S=31 $\frac{1}{4}$ "	35 to 105 r.p.m. 1 $\frac{1}{2}$ h.p.

*Never before*

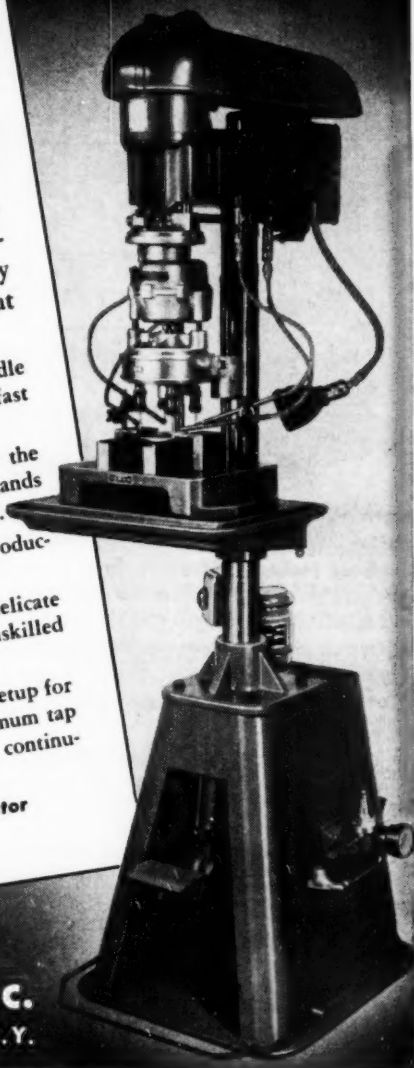
A TAPPING MACHINE WITH  
ALL THESE ADVANTAGES

**Ettco-Emrick**  
**FOOT OR AIR OPERATED**  
**72A TAPPING MACHINE**

Here is a fast, versatile foot or air operated tapping machine that puts high production precision tapping within easy reach of all manufacturers. Here's what it offers —

- **VERSATILITY.** Interchangeable single spindle tapping units and multiple heads permit fast changeovers from job to job.
- **HIGH SPEED.** Foot or air pressure does the work with a minimum of effort. Both hands are free to handle the part being tapped.
- **ECONOMY.** Low initial cost and high production rates add up to big savings.
- **BUILT-IN SENSITIVITY.** No skill or delicate touch is needed — it's ideal for unskilled operators.
- **ADAPTABILITY.** There's a lubrication setup for any tapping — gravity feed for minimum tap lubrication — a pumped oil bath for continuous flow.

For details, ask your distributor  
for Bulletin #72A.



**ETTCO TOOL CO., INC.**

594 Johnson Ave. • Brooklyn 6, N.Y.

## Michigan Tool Company

Detroit 12, Michigan

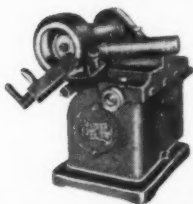
Type and Model	Capacity Gear Size Min. and Max. Face Width F= Max.	Pitch C= Coarse; F= Fine	Maximum Stroke	H. P. (Main Drives Only)
<b>Shear-Speed Shaper Line</b>				
Model 1833	1" to 3"; F=2½"	C=8; F=12	3"	15
1853	3" to 5"; F=2½" with liner: 1" to 5"	C=7; F=12	3"	15
1873	5" to 7"; F=2½" with liner: 3" to 7"	C=6; F=12	3"	25
18105	7" to 10"; F=2½" with liner: 5" to 10"	C=5; F=12	3"	30
<b>Rotary Gear Finishers</b>				
Model 870-A; 870-A-8	1" to 8"; F=5"	C=5; Max. shaft length, gear at one end=13"	5"	3
870-12; 870-A-12	1" to 12"; F=5"	C=4; Max. shaft length=13"	5"	3
870-18; 870-A-18	1" to 18"; F=5"	C=4; Max. shaft length=13"	5"	3
<b>Gear Finishers, Fine Pitch</b>				
Model 861-4B	¼" to 4"; F=1"	Max. pitch=16; Max. spread of centers=9"		¼ h.p. cutter drive motor
<b>Gear Lapper, Two Lap</b>				
Model 995	½" with 6½" lap to 8" with 9" lap; F=3". Lapper also available in larger capacities	Dia. of lap 6½" min. to 9¼" max. Length between centers=12"	Lap spindle speed=300 max.. 90 min.	2 h.p. reciprocating
<b>Rotary Crossed-Axis Gear Finishers</b>				
Model 873-18-A	0" to 18"; F=15"	C=2; Max. shaft length, gear at one end=36"		3 h.p. spindle drive 1 h.p. tra- verse feed drive
873-24-A	0" to 24"; F=15"	C=2; Max. shaft length=36"		do
<b>Gear Shavers</b>				
Model V-48- External	8" to 48"; F=30"	Max. dia. of cutters=12W		
Model V-48- Internal	Max. O.D. 54"; F=8"	Max. pitch dia.=48"; Min. pitch dia.=6"		
V-72	20" to 72"	C=2; Max. pitch dia.=12"; Min. pitch dia.=7" Max. cutter width=5"	Shaving ranges 50"	
V-120	60" to 120"	C=2	Shaving ranges 50"	
V-180	100" to 180"; F=65"	Max. pitch dia.=16"; Min. pitch dia.=8" Max. cutter width=5"	Shaving ranges 65"	
875-18" (Horizontal)	4" to 48"; F=36"	Max. distance between centers=97"		
<b>Hobbing Machine</b>				
Model 1458	2½" to 8"; F=4½"		Spindle Speeds: 1000 r.p.m. and up	15

## OLD FASHIONED METHODS

Work, but — Slowly  
Modern Production  
Calls for  
**EFFICIENCY with Speed**

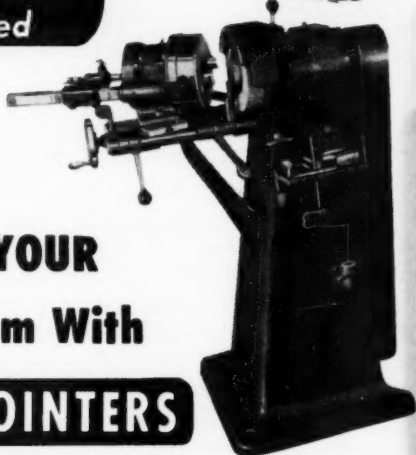


**Maintain Production  
Schedules**



**Equip YOUR  
Tool Room With**

## OLIVER DRILL POINTERS



There are many ways to sharpen drills but it's generally accepted that machine grinding is the best and most accurate method. Many production slowdowns are due to excessive drill costs and imperfect holes. In most cases, they can be traced to improper grinding of the drill points. OLIVER Drill Pointers give balanced cut, with each lip doing equal work. Machine grind your drills to cut faster, last longer and produce more accurate holes.

**LET US PROVE IT** — Send us a few of your drills to sharpen — then check the results on your own production. No obligation.

### Just a Tip



### Use OLIVER Drill Pointers

No. 510 for drills  $\frac{1}{4}$ " to 3"—2-3-4 flute. Variable clearances. Variable point angles. Full automatic operation.

No. 21 Oliver Bench Grinder. Hand operated for Drills No. 57 to  $\frac{1}{2}$ ". Right hand, with an improved point. Attachments are available for grinding oil hole drills, left hand and other special points.

Write for literature that will save you dollars in your tool room.

# OLIVER INSTRUMENT CO.

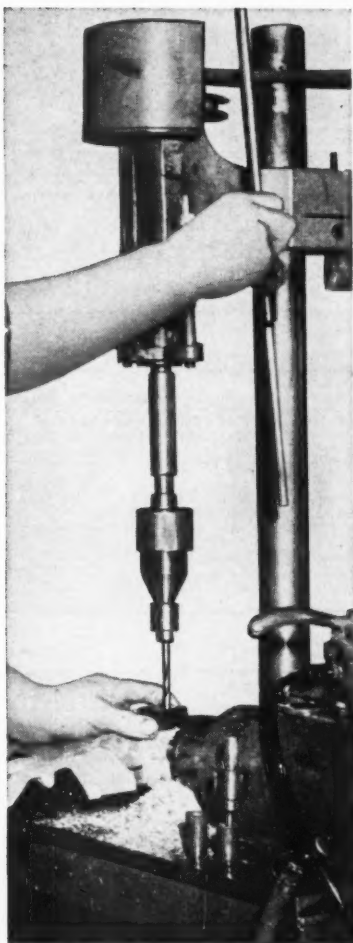
1408 E. MAUMEE • ADRIAN, MICHIGAN

AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS—DRILL  
POINT THINNERS—TEMPLATE  
TOOL GRINDERS—FACE MILL  
GRINDERS—DIAMAKING MACHINES

Barber-Colman Company			Rockford, Illinois	
Type and Model	Max. Dia. Pitch and Dia. in Steel	Length of Cut	Work Diameter	Max. Distance Work Spindle Face to Tail Center
<b>Automatic Hobbing Machine</b> No. 1½	36 D.P.; 1" dia. in steel 24 D.P.; 1" dia. in brass	¾"	1"	2-15/16"
<b>Horizontal Hobbing</b> No. 6-10	16 D.P.—2" dia.; 24 D.P.—3" dia.; 34 D.P.—5" dia.	7"	5"	15¾"
<b>Vertical Production Hobbing</b> No. 8-10	4.5 D.P.—8" dia.	8"	8"	20"
<b>Horizontal Production Hobbing</b> No. 14-15	3.5 D.P.—4"; 4 D.P.—7"; 5 D.P.—10"; 6 D.P.—14"	14"	14"	27¼"
<b>Horizontal Hobbing</b> No. 16-11	8 D.P.—8"; 10 D.P.—10"	10"	10"	48¾"
<b>Universal Hobbing</b> No. 16-16	6 D.P.—4½"; 7 D.P.—6"; 8 D.P.—8"; 10 D.P.—10"	12"	10"	26¾"

Farrell-Birmingham Company, Inc.			Buffalo 7, New York	
Type and Model	Dia. of Gears, Min. and Max.	Face of Gear, Min. and Max. H=Double Helical S=Straight Tooth	Diametral Pitch (In Plane of Rotation) Min. and Max. H=Helical S=Straight Tooth	Hole in Spindle
<b>Gear Generators</b> (Farrel-Sykes)				
1A	0"-12"	H=0" to 5"; S=0" to 2½"	H=24 and 3 S=24 and 2½	4¼" and 3¾"
2C	0"-25"	H=0" to 8"; S=0" to 5"	do	3¾"
3C	0"-37"	H=0" to 8"; S=0" to 5"	do	
4B	1"-49"	H=0" to 18"; S=0" to 10"	H=12 and 2; S=12 and 1½	9¾"
5B	1"-61"	H=0" to 18"; S=0" to 10"	do	do

## High Production...Low Cost at Remington Rand with Wahlstrom Automatic Chucks



"Our drilling and reaming are performed with a single-spindle drill press, through use of the Wahlstrom Automatic Chuck," reports A. Dressler, Production Manager of Remington Rand Inc.'s Elmira plant. "With Wahlstrom Chucks, cutting tools are changed in seconds while the drill spindle is running... giving us high production at low cost."

You, too, will find that *one spindle does the work of several* when you use AMF Wahlstrom Automatic Chucks. Save tool-change time in drill press work...spotting, reaming and drilling in jig borers and millers...in lathe work for burring, turning and filing.

Wahlstrom Chucks—the only *fully-automatic* drill chucks holding widest range of straight-shank tools. Available in Model A— $\frac{1}{32}$ " to  $\frac{1}{2}$ "...Model AA— $\frac{1}{64}$ " to  $\frac{3}{8}$ "...Model B for larger straight-shank tools...Model C for taper-shank tools and fully-automatic tappers.

See your local distributor or write for Bulletin 56-4.

AMERICAN MACHINE & FOUNDRY CO.  
Wahlstrom Tool Division, 5502 Second Ave., Brooklyn 20, N. Y.

### WAHLSTROM



fully automatic

### CHUCKS

NO KEYS, COLLETS OR WRENCHES

Gleason Works		Rochester, New York		
Type and Model	Capacity C=Max. Cone Distance P=Max. Pitch Diameter	F=Max. Face Width R=Max. Ratio (90° Shaft Angle)	Coarest Diametral Pitch	H. P.
<b>Revox Rougher</b> No. 7	C=7½"; P=14"	F=2"; R=6/1	3	6¼
<b>Rougher</b> No. 12B	C=9"; P=18"	F=2½"; R=10/1	4	4½
<b>Straight Bevel Generators</b> No. 2	C=2¼"; P=4½"	F=¾"; R=Any practical ratio	16	¾
No. 14	C=12"; P=24"	F=3½"; R=10/1	3	4½
No. 24A	C=17¼"; P=35½"	F=6"; R=10/1	1½	9½
<b>Spiral Bevel and Hypoid Generators</b> No. 2	C=2½"; P=4¼"	R=Any practical ratio	16	¾
No. 7	C=4¼"; P=8½"	R=10/1	4	3¼
No. 16	C=9"; P=18"	do	2½	5
No. 26	C=16½"; P=29½"	do	1½	9½
<b>Spiral Bevel and Hypoid Generator</b> 60"	C=33"; P=66"	do	1	10
<b>Gear Grinder</b> No. 27	C=16"; P=23"	do	2	11¼

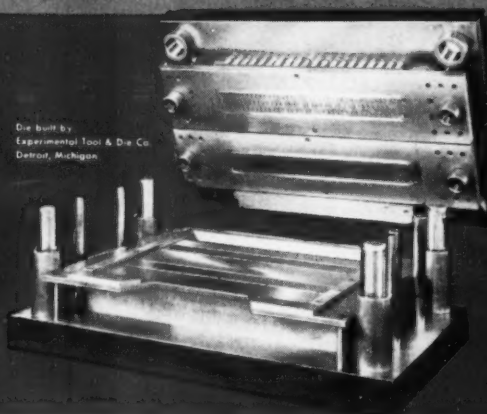
Hamilton Tool Company		Hamilton, Ohio		
Type and Model	Capacity Workpiece and Gear D'a.	Max. Length of Gear Tooth Max. Length of Feed	P=Max. Diametral Pitch Min. and Max. Spiral Lead	Min. and Max. Distance Between Spindle Noses
<b>Gear Hobber (Precision)</b> Model No. 1	Both 6"	Both 5"	P=12; .800" to 130"	4" and 8½"
<b>(Precision)</b> Model No. 00	Both 2"	Both 1.6"	P=20 in brass, 25 in steel Max. Dia. of hob=1" Max. width of hob=7/16"	2" and 2¾"

The Adams Company		Dubuque, Iowa		
Type and Model	Gear Diameter	Distance Between Centers	Dia. Through Hollow Spindle	Max. Cutter Dia.
<b>Gear Hobber and Thread Miller</b>				
No. 5	16"	48"	3"	6"
No. 6	16"	24"	3"	6"
<b>Manufacturing Hobber</b>				
No. 5-M	8"	48"	3"	6"
No. 6-M	8"	24"	3"	6"

## PIECE PART REJECTIONS REDUCED

Diemakers at Experimental Tool & Die Company solved a costly repair soldering problem on these stamped radiator heads with the die shown below. Precision was the secret. Die tolerances were held to within .0001" and all die components had to be interchangeable. That's why they specified ...

Die built by  
Experimental Tool & Die Co.  
Detroit, Michigan



# DANLY

## DIEMAKERS' SUPPLIES and PRECISION DIE SETS



Die Sets



Dowel Pins



Die Springs



Cap Screws



Stripper Bolts

### CALL ON THE DANLY BRANCH CLOSEST TO YOU FOR FAST LOCAL SERVICE

- \*CHICAGO 50, 2100 South Laramie Avenue
- \*CLEVELAND 14, 1550 East 33rd Street
- \*DAYTON 7, 3196 Delphos Avenue
- \*DETROIT 16, 1549 Temple Avenue
- \*GRAND RAPIDS, 113 Michigan Street N.W.
- INDIANAPOLIS 4, 5 West 10th Street
- \*LONG ISLAND CITY 1, 47-28 37th Street
- \*LOS ANGELES 54, Ducommun Metals & Supply Co.,  
4890 South Alameda
- MILWAUKEE 2, 111 East Wisconsin Avenue
- PHILADELPHIA 44, 18 West Chelton Avenue
- \*ROCHESTER 4, 16 Commercial St.

\*Indicates complete stock

Diemakers everywhere depend on Danly precision. Every Danly product—die sets, dowel pins, die springs, cap screws, stripper bolts—is designed to complement the finest die work. For complete, reliable service, come to Danly!

# DANLY

DANLY MACHINE SPECIALTIES, INC.

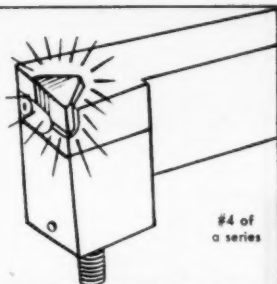
2100 South Laramie Avenue, Chicago 50, Illinois

Pratt & Whitney Div., Niles-Bement-Pond Co.			West Hartford, Connecticut	
Type and Model	Outside Diameter	Diametral Pitch, Min. and Max. T=No. of Teeth	Length Between Centers	Face Width
Gear Grinders Single Wheel	10 1/2"	3 and 16 T=7	13 1/4" and 14 1/4"	5 1/4" or 5"
Two-Wheel Machine	do	do	do	1 1/4"

Fellows Gear Shaper Company			Springfield, Vermont	
Type and Model	P=Max. Pitch Dia. DP=Max. Diametral Pitch	Max Face Width	Max. and Min. Distance Top of Table to Center Line of Tool Spindle	Max. Stroke
<b>Gear Shaving</b>				
No. 8	P=8"; DP=4	2 1/2"	13 1/2" and 9 1/2"	4"
No. 12	P=12"; DP=6	3"		3 1/2"
No. 18	P=18"; DP=4	5"		5 1/2"
No. 24	P=24"; DP=4	5"		5 1/2"
No. 4	P=4"; DP=20	1"	4" and 1 1/4"	
<b>Internal Shaving</b>				
No. 11	DP=6	Up to 10 pitch, 1 1/4" 12 to 16 pitch, 1"		
<b>Shaping Machine</b>				
36"	P=36, ext. and int. DP=3 spur; 4/5 helical	6" int. and ext.		
<b>Thread Generator (Hour Glass)</b>				
No. 6T	Max. pitch=.7854 C.P. or 3/4 diametral	Max. hel. angle; 15° Max. pressure angle 14 1/2°	Max. and min. work and cutter center distance 3 3/4" and 1 1/4"	
<b>Thread Generator</b>				
No. 2T	Max. pitch=16	Max. length of thread=2 1/4" Max. O.D. of work=2"	Distance Between centers=8" Distance between cutter and work=2 1/4"	Max. pressure angle=14 1/2° Max. helical angle=15°
No. 4T	5/8 linear or 5 diametral	Max. length of thread=12" Max. O.D. of work=4"	Distance between centers=18"	do
<b>Rotary Gear Shaper</b>				
No. 10	P=3" DP=Spur 3/4, helical 5/7	Face width=3"	No. stations=10	

# Tool Saving Tips

## USE KENNAMETAL SERVICE AIDS



**KENNAMETAL TOOL MANUAL**

Gives information on proper selection, application, and maintenance. Many useful tables, typical job lay outs, etc. Vest pocket size.



**CLAMPED TOOL MANUAL**

Describes and illustrates how you can make a wide variety of special purpose mechanically-held tools in your own shop. Letter size.



**PERFORMANCE REPORTS**

Contain specific data on tooling and methods used in hundreds of shops to save tools, floor-to-floor time, and grinding expense. Letter size.



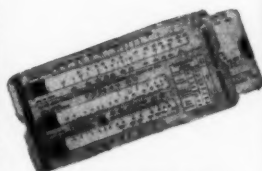
**KENNAMILLING MANUAL**

Illustrates and describes operation and maintenance of various inserted-blade cutters. Contains unique "trouble-shooting" section. Vest pocket size.



**FIELD SERVICE**

Our field engineers offer you the greatest collection of carbide tooling "know how" that is available through any one source.



**KENNAMETAL CALCULATOR**

Automatically correlates various factors to give proper speed and feed rates for turning, boring, milling. Eliminates guesswork and calculating. Vest pocket size.

All these service aids are available to you to help you get more work from fewer carbide tools. Ask your nearest Kennametal representative about them, or write to us.

**KENNAMETAL Inc.**, Latrobe, Pa.  
®  
 MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES  
 AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

**Fellows Gear Shaper Company**
**Springfield, Vermont**

Type and Model	Max. Face Width	S=Max. Pitch Dia. External Spur H=Max. Pitch Dia. External Helical	do Sp=Max. Pitch Spur He=Max. Pitch Helical	Max. Pitch Dia. Internal
<b>Gear Shapers</b>				
No. 7	1½"	S=7"	Sp=6	
No. 71	1½"	S=7"	Sp=6	
No. 72	1" internal gears	S=7"	Sp=6	5½"
No. 712	do	S=7"	Sp=6	5½"
No. 75	1½"	S=7"; H=6½"	Sp=6; He=6/8	
No. 715	1½"	S=7"; H=6½"	Sp=6; He=6/8	
No. 725	1" internal gears	S=7"; H=6½"	Sp=6; He=6/8	5½"
No. 1725	do	S=7"; H=6½"	Sp=6; He=6/8	5½"
No. 77			Sp=8	4"
No. 775			Sp=8	4"
No. 7A	2"	S=7"	Sp=5/7	
No. 71A	2"	S=7"	Sp=5/7	
No. 75A	2"	S=7"; H=7"	do	
No. 715A	2"	do	do	
No. 725A	2"	do	do	6"
No. 7125A	2"	do	do	6"
No. 77A			Sp=8	5"
No. 775A			Sp=8; He=8/10	5"
No. 61A	3" internal 5" external	S=¾"; H=5/7 for Models 615A; 645A; 65A3; 645A3		18" max. internal and external

The No. 6 type is available in Models 61A; 612A; 64A; 624A; 615A; 645A; 62A3; 624A3 65A3; 645A3. Specifications are same for all models. Difference lies in cutter and work spindle combinations.

No. 61	5" ext.; 3" int.	S=35"	Sp=4	25" spur
No. 612	do	S=35"	Sp=¾	do
No. 64	do	S=35"	Sp=4	do
No. 624	do	S=35"	Sp=¾	do
No. 615	do	S=35"; H=35"	Sp=4; He=5/7	25" spur; 24" helical
No. 645	do	do	do	do
No. 64Y	5" ext.; 3" int.	S=36"; H=36"	Sp=4	43" spur; 43" helical
No. 645Y	do	do	Sp=4; He=5/7	do
<b>Fine Pitch Shaper</b> 3"	¾"	Max. pitch dia.=3". Max. dia. pitch; 30 for free-cutting brass; 32 for other non-ferrous metals; 40 for free-cutting steel.		
<b>Gear Lapping Machines</b> Nos. 7 and 8LS	1¾"	Center distance of work and lap spindles=5"		7" or 8" Min. pitch dia.=2"
Nos. 10 and 13LS	1¾"	Center distance of work and lap spindles=7"		10" or 13"; Min. pitch dia.=3"

**Waltham Machine Works**
**Waltham, Mass.**

**2" SPUR GEAR CUTTING MACHINE.** Standard work slide cam allows an adjustment of strokes between 1.4" and 2.4". For pinion work a shorter throw cam can be furnished. A 120 division index is furnished. Adjustments of 6-8-10-20-24-30-40-60-120 can be obtained.

**1½" PINION AND GEAR CUTTING MACHINE.** Coarsest pitch about 32 DP; strokes of work slide for pinions .25" to 45"; strokes of work slide for staked gears, .85" to 1". For gear machines pitch diameter is 1½"; strokes for work slide, .40", .65", 1", 1.25".

2" and 4" GEAR CUTTING MACHINES are made to special order.

# 1952 INDUSTRIAL EXPOSITION



100,000 square feet of exhibits of the newest ideas in machines, machine controls and machine accessories, tools and gages, materials handling. Plus new tool and die materials, new manufacturing processes, new ideas in inspection methods and equipment, quality control—all designed to help you boost productivity, cut cost, improve product quality.

Five days of technical conferences, discussion panels and forums—the most important in A.S.T.E. history:

**Monday—Inspection and Quality Control Day**  
**Tuesday—Metal Cutting Day**  
**Wednesday—Materials Forming Day**  
**Thursday—Grinding and Finishing Day**  
**Friday—Machine Accessories, Drives and Controls Day**

Estimated attendance, March 17 to 21, inclusive—80,000.

*It is NOT too early to make your reservation*



**AMERICAN SOCIETY OF TOOL ENGINEERS**  
**EXPOSITION COMMITTEE**

10700 PURITAN AVENUE • DETROIT 21, MICHIGAN • UNIVERSITY 4-7300

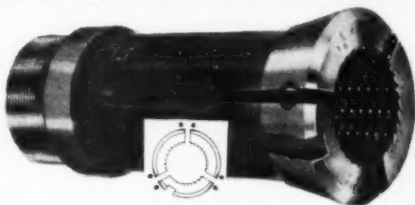
**Gould & Eberhardt****Irvington 11, New Jersey**

Type and Model	Max. Diametral Pitch (Steel)	Face Capacity: H=45° Helical Gears SS=Spur Pinions and Gears	Max. Diameter SS=Spur Gear (with support) S=Spur Gear (without support) H=45° Helical Gear	Number and Range of Hob Speeds Horse Power
<b>Gear Hobbing Machine</b>				
12H	5	S=10"; H=8"	SS=10"; S=18"; H=12"	12-50-300 r.p.m. 5 h.p.
16H	4	S=11"; H=9"	SS=16"; S=18"; H=16"	12-40-235 r.p.m. 5-7½ h.p.
24H	3½	S=15"; H=12"	SS=18"; S=24"; H=24"	12-40-235 r.p.m. 5-7½ h.p.
36H	3	do	SS=24"; S=36"; H=36"	12-30-175 r.p.m. 7½-10 h.p.
48H	2½	S=16"; H=12"	SS=32"; S=48"; H=48"	12-22-130 r.p.m. 10-15 h.p.
72H	1½	S=24"; H=18"	SS=48"; S=90"; H=72"	14-6-100 r.p.m. 15 h.p.
<b>Spur Gear Machine</b>				
36S	4	12" spur gears	SS=19"; S=36"	39-190 r.p.m. (cutter speeds)
60S	1½	16" spur gears	SS=32"; S=72"	20-91 r.p.m. (cutter speeds)
<b>Spur and Bevel Gear</b>				
36B	4	12" spur gears 24" mitre gears	SS=19"; S=36"	39-190 r.p.m. (cutter speeds)
60B	1½	14" spur gears 48" mitre gears	SS=72"	20-91 r.p.m. (cutter speeds)
<b>Multiple Spindle Spur and Bevel Gear Cutting</b>		Capacity: 2 gears up to 11" dia., 4 D.P. 3 gears up to 5½" dia., 5 D.P.		
36BM		2 gears up to 18" dia., 2 D.P. 3 gears up to 9" dia., 2½ D.P.		
60BM		Arranged with 3 spindle fixed work head, machine will cut at one time, 2 gears of 15" dia. or 3 gears 9" dia., 3 D.P.		
<b>Multiple Spindle Gear Rack Cutting</b>		Capacity: 48" long, 6" face, 4 D.P. 72" long, 10 face, 1½ D.P.		
36R				
60R				

**Bilgram Gear & Machine Works, Inc.****Philadelphia, Pennsylvania**

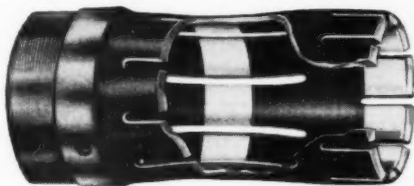
Type and Model	Face and D.P.	Range of Pitch Angular Adjustments	Largest Outside Diameter	Apex Distance
<b>Bevel Gear Generator</b>				
6"	3" Face, 3½ D.P.	9° to 85°	1:1 ratio=6½" 2:1 ratio=7½" 6:1 ratio=6½"	7½"
16"	6" Face, 2 D.P.	7°8' to 82°52'	16" O.D. ratio, straight teeth=8:1; Ratio, spiraloidal teeth=4:1	11"
<b>Gear Chamfering</b>	Max. capacity; 18" wheel dia. Min. capacity; Pinions with as few as 5 teeth	Max. stroke of ram=6"		

# ***SHEFFER PRODUCTS ARE BEST***



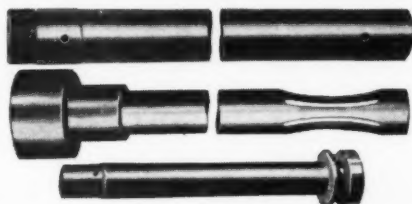
## **CLOVER-LEAF COLLETS**

Standard sizes and designs for all types of automatic screw machines, lathes, milling machines. Special collets made to your prints.



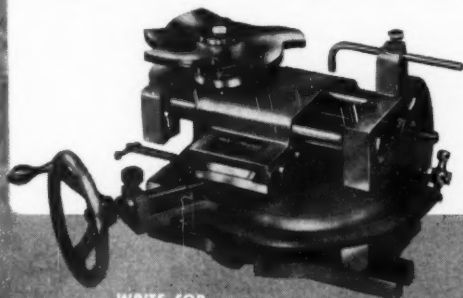
## **FEED FINGERS**

"Economy" pusher has ground mid-section bearings. Positive grip with less pressure. More pieces per bar. Also "B B" Master and conventional "squirrel cage" pushers.



## **TUBES**

Collet tubes and pushers tubes with spools. Collet tube adjusting nuts. Pusher tube bushings for all automatic screw machines.



## **HELIX-MASTER**

Cuts flat cams without layouts — directly from engineers' figures. Perfect rises allow greater machine speeds and give longer tool life.

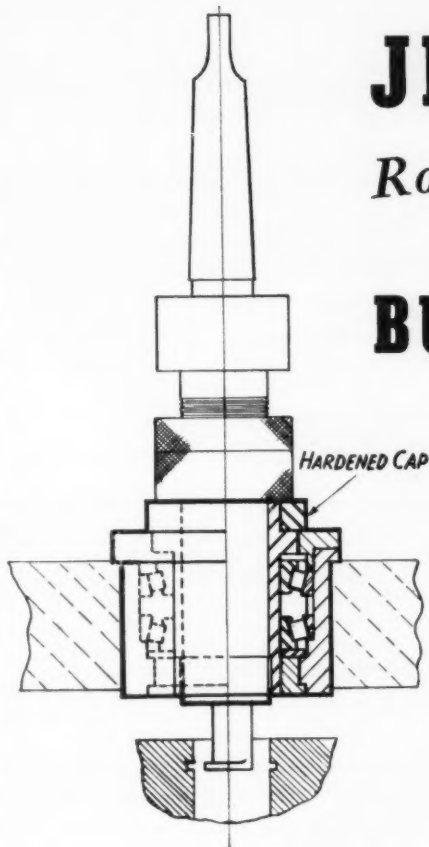
WRITE FOR  
LITERATURE

**SHEFFER**  
COLLET COMPANY  
TRAVERSE CITY • MICH.

**Gear Grinding Machine Company**
**Detroit, Michigan**

Type and Model	C=Between Centers S=Max. Swing	F=Face Width D=Diametral Pitch	Number of Teeth	Gear Diameter
<b>Gear Grinder</b> GG-10x24A	C=24"; S=12½"	F=10"; D=32 to 4	4 to 120	¾" R.D. to 10" O.D.
GG-10x48A	C=48"; S=12½"	F=34"; D=32 to 4	do	do
GG-16x18A	C=22"; S=17½"	F=10"; D=32 to 4	3 to 220	¾" R.D. to 16" O.D.
<b>Spline Grinder</b> SG-10x24A	C=24"; S=12½"	F=10"	4 to 120	Spline dia.; 1" to 6" O.D.
SG-10x48A	C=48"; S=12½"	F=34"	do	do
GG-11	C=24"; S=10"		4 to 80	do
SG-17	C=42" S=12⅝"		3 to 108	do
SG-33	C=42" S=16⅞"		6 to 200	do
SG-36	C=42" S=20⅞"		do	do
<b>Straight Spline Grinder</b> SG-12	C=60"; S=12⅞"		3 to 108	Spline dia.; 1" to 6" O.D.
SG-15	C=60"; S=16⅞"		6 to 200	do
SG-16	C=80"; S=12⅞"		3 to 108	do
<b>Internal Gear &amp; Spline Grinder</b> GG-30	S=20"	F=3"; D=32 to 4	6 to 120	Int. Gear Dia.= 3⅝" to 16"
GG-31	S=20"	F=3"; D=32 to 4	4 to 108	Int. Gear Dia.= 3⅝" to 12"
GG-1-16x3A	C=20"	F=3"; D=32 to 4	4 to 200	Int. Gear Dia.= 6⅝" to 16"
GG-29 (Combination internal and external gear grinder)	S=20"	F=2⅝"; D=32 to 4		Int. Gear Dia.= 3" to 8" Ext. Gear Dia.= 2" to 12"
<b>Oscillating Gear Grinder</b> OG-9x6	Max. Length=6"	Typical Ball Bearing Race, Outer=2" Max. Typical Ball Bearing Race, Inner=9" Max.		Max. Int. Dia. (Cylindrical)= 8"; Max. Ext. Dia. (Cylindri- cal)=9"; Min. Ext. Dia. (Cylindri- cal)=¾"
CS-1	Max. dia. of work on oscillating arbor=6-1/16"; max. width of work=3"; arc of oscillation=0° to -15° Travel of spindles, each -4"; width of ground perforations=⅝" to 2"; number of oscillations, per min: 120			
<b>External Gear &amp; Spline Grinder</b> GG-19 (Ext. gear & involute spline)	C=24"	D=32 to 4	4 to 80	10"
SGG-19 (External gear, in- volute and straight spline grinder)	do	do	do	10" Spline dia.; 1" to 6" O.D.
<b>External Gear Grinder</b> GG-34	C=11" to 15½"	do	4 to 108	1" to 12"

*For Recessing Tools  
Rely on—*



**JERGENS**  
*Roller Bearing*  
**PILOT  
BUSHINGS**

With their thrust and radial features, you are assured of long wear, freedom from chatter and extreme accuracy. Jergens Pilot Bushings offer effective seal against dust and grit, minimize "down" time and keep machines working and earning. Many applications. Proven in the experience of large users.

**J. G. JERGENS COMPANY**  
**11106 Avon Avenue** **Cleveland 5, Ohio**

**Gear Grinding Machine Company****Detroit, Michigan**

GG-35	do	do	6 to 200	1" to 18"
GG-24-30	C=30"	D=16 to 1½ or 24 to 4	6 to 200 and 200 to 400 even numbers	24"
GG-24-48	C=48"	do	do	do
GG-30-33	C=30"	do	do	33"

**Lees-Bradner Company****Cleveland, Ohio**

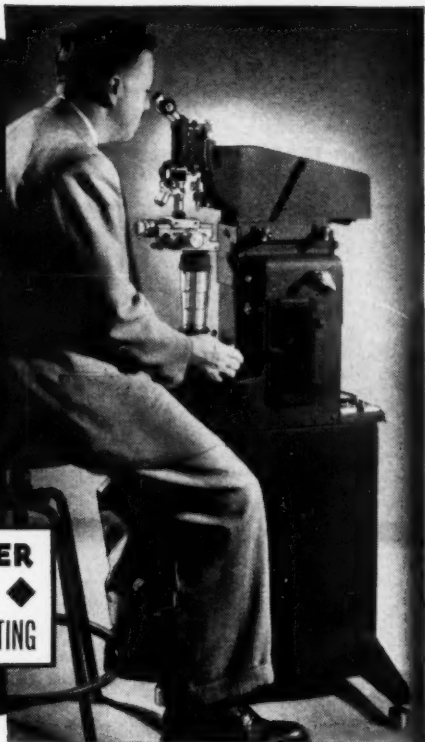
Type and Model	Max. Dia. Capacity	F=Max. Face Width C=Dist. Between Centers	Max. and Min. Hob Dia.	No Spindles
<b>Hobbing Machine</b> Model 7-A	With 3" hob; 8" With 4" hob; 7"	F=9"	4" and 4"	Single. Model 7-A also available in 4, 6, and 8 spindles. Same specs.
<b>Horizontal Spline and Hobbing Machine</b> Model SH 6 x 24"	8¼" with 4" hob	C=24"	4" max. dia.; 4" max. hob length	Swing over ways; 24" Swing over carriages; 12"
6 x 36"	do	C=36"	do	do
6 x 54"	do	C=54"	do	do
6 x 102"	do	C=102"	do	do
<b>Automatic Gear Hobbing Machine</b> Model 12-S 13" x 16"	With 3" hob; 13" With 4" hob; 12"	F=16"	4" and 4"	

**Newark Gear, Inc.****Newark 5, New Jersey**

Type and Model	Dia. and Face	Pitch Capacity	Wheel Diameter	Horse Power
<b>Universal Gear Hobbers</b> No. 3	18" dia. x 14" face	4 D.P. steel; 3 D.P. cast iron	17½"	5 h.p.
No. 5A	72" dia. x 20" face	2 D.P. steel; 1½ D.P. cast iron	36½"	7½ to 10 h.p.
<b>Automatic Spur Gear Machine</b> No. 3	40" x 16"	4 D.P. steel; 3 D.P. cast iron	19½"	2 h.p.
No. 5	72" x 16"	2 D.P. steel; 1½ D.P. cast iron	38½"	5 h.p.
No. 55	48" x 16"	do	do	do
No. 7	100" x 24"	1 D.P. steel; ¾ D.P. cast iron	53½"	10 h.p.
SPUR GEAR, using disc cutters (vertical) 84 VG	90" dia., 40" dia. with support columns	1 D.P., or 3 C.P. in steel; ¾ D.P. or 4 C.P. in grey iron	46½" between work and cutter arbors (without column support) Min. centers=4"	Work table is 42" dia. with 12" dia. hole, 10 h.p.

# Assured Accuracy with

**TUKON TESTER**  
for  
**MICROHARDNESS TESTING**



*Researchers and scientists  
accept TUKON's precision and repeated accuracy*

Where minute indentations and extreme accuracy are necessary, the TUKON Microhardness Tester meets the most exacting requirements. A sensitive mechanically or electrically controlled system, with microscopic viewer, is employed.

On hardened steel, length of in-

dentation with 100 gram load is .0016", depth only .00005"; very small metallic crystal areas can be tested. TUKON models are available for testing delicate watch parts to properly prepared specimens of heavy machinery parts. TUKON is necessary in every metallurgical department.

*Information on the correct TUKON Microhardness Tester for your work will be sent on request. Just give us details of the job.*

**ACCO**



## WILSON

**MECHANICAL INSTRUMENT DIVISION  
AMERICAN CHAIN & CABLE**

**230-T Park Avenue, New York 17, N. Y.**

# HOW A J & S "Fluidmotion" WHEEL DRESSER cut production costs FOR THE ADAMAS CARBIDE CORPORATION

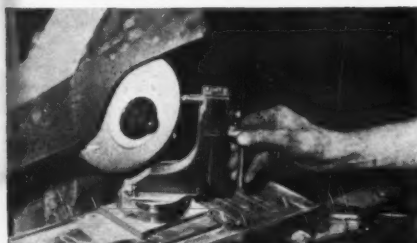
Paul C. Boniti, Shaping and Forming Supervisor of the Adamas Carbide Corporation, Harrison, N. J., reports that his standard Model "E" J & S "Fluidmotion" Wheel Dresser has



**1** To set-up for convex radius, first mike distance from diamond point to micrometer plate, then add radius desired. (For concave radius, subtract).



**2** Slide dresser in dust-proof channel till mike slips over pins as shown and lock with socket wrench. Dresser is now ready for action.



**3** Bring diamond point up to center line of wheel, rotate dresser on swivel base in one continuous motion. A clean, accurate radius results! No chatter marks.

OTHER "Machine Shop TIME SAVERS" by J & S  
J & S "All-Purpose" Jaw Clamps, KOALA Circular Cutting Tool,  
"Down-Hold" Vise Jaws, and "Attachable" Parallels. Write for  
"Time Savers" Booklet.

- Cut set-up time
- Cut dressing time  
(save on diamond and wheels)
- Cut maintenance cost

In 4½ years grinding presintered carbide has cost  
\$17.50 to maintain — less than \$4.00 per year.

HOW "Fluidmotion" saves time is demonstrated at left. Photos taken at Adamas Carbide show how a concave or convex radius—accurate to .0001" can be obtained in three simple steps.

Dressing two angles tangent to a radius is simple. Only one more step is necessary. After radius is set (steps 1 and 2) the dresser is swung on its graduated base to first one angle, then the other, and both are locked in with a turn of the knurled knob. Actual dressing is again accomplished in one continuous motion—it is not necessary to move the dresser on dove tails to form the angles.

It is important in our work to have a rigid dresser that can dress a wheel true consistently, leave no chatter marks, and still not have the abrasive content in the presintered material affect the accuracy of the dresser. This I can personally vouch for. J & S "Fluidmotion" in 4½ years has passed this test. I have complete confidence in "Fluidmotion"—no trial and error in order to obtain accurate forms. Our company has enjoyed the lower production cost made possible by "Fluidmotion's" repeated accuracy and ruggedness. It's a cinch to do our grinding jobs.

Adamas Carbide, well known for its high quality, low cost carbide blanks, attributes a fair share of its success in attaining more efficient production to its J & S "Fluidmotion" Wheel Dresser.

You, too, can also cut production costs by employing the J & S "Fluidmotion" Dresser in your tool room.

Application to any surface or cylindrical grinder is quick, simple. Set-up and dressing time is yet the lowest to be found.

Wheel Dressers made to dress wheels accurately up to 36" in diameter, and designed to meet your grinding requirements.

Reg. U. S. Pat. Off.

For details, write to:

**J & S TOOL CO., INC.**  
471 Main Street, East Orange, N. J.  
Representatives in Principal Cities

## Chrome carbides open new fields of application for metallic carbides

An entirely new tungsten- and cobalt-free family of metallic carbides, to be known as Series 600, having physical properties better in many respects than conventional tungsten carbides, is now in the limited pilot plant stage and expansion is underway for full production by the Carbology Department of General Electric Co., Detroit 32, Mich.

The new carbide, produced from powdered metals, contains approximately 70% by weight of chromium and is thus primarily a "chrome-carbide." Field tests on several applications have been completed. Due to its striking physical properties, its introduction opens up many new fields of application for metallic carbides. It eliminates costly and strategic tungsten and cobalt.

### Properties of new carbide

Properties of Series 600 carbides include extremely high resistance to abrasion, erosion and corrosion; lighter weight; a coefficient of thermal expansion approximately the same as that of steels; and extreme resistance to oxidation even at high temperatures. It is completely non-magnetic.

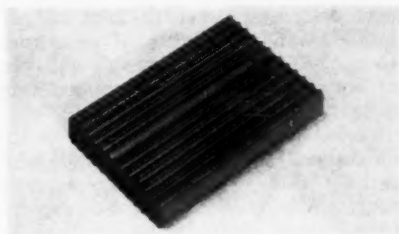
Although the new material may find some applications where tungsten carbides are used at present, it is not expected to supplant the latter, since the properties of Series 600 supplement rather than 'compete' with conventional tungsten carbides.

In the gage field, Series 600 is currently being used in pilot quantities for the production of gage blocks, ring gages, plug gages, and gage anvils (ribbed surface plates). In this field, figure 1, its success is due to its ability to resist both abrasion and corrosion plus the fact that, having about the same coefficient of expansion as steels,

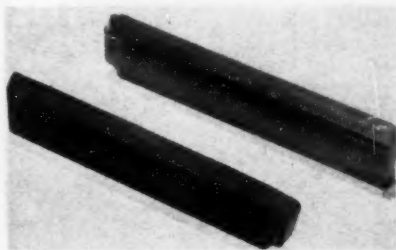
gaging results are not affected by air temperature variations (no correction charts need be used). Its lighter weight than tungsten carbides increases ease of handling and facilitates the use of solid carbide.

In valves used in the petroleum industry (chrome carbide balls used in combination with Grade 55A tungsten carbide valve seats), Series 600's performance is traceable to a combina-

**1. Gage anvils currently being made of Series 600 chrome carbide.** In the gage field the material resists corrosion and abrasion. Since its coefficient of expansion is about the same as that of steels, readings are not affected by temperature variations.



**2. An even higher resistance . . . to combined erosion, corrosion and abrasion than tungsten carbides is demonstrated by these centrifugal blades.** Both were run for six weeks. The tungsten carbide is at the front, Series 600 chrome carbide at the rear.



tion of lighter weight (less pounding) than tungsten carbide balls; and its greater ability to resist abrasion, corrosion and particularly erosion.

The combination of erosion, corrosion and abrasion resistance also accounts for the successful application in centrifuge blades. Shown in figure 2 are two carbide blades after running for six weeks under severe conditions. The worn blade (in front) is of tungsten carbide, previously considered the outstanding material for this type of application. The blade at the rear is of Series 600 chrome carbide. Life of steel blades is very much shorter than either, of course.

### Availability of Series 600

In general, Series 600 chrome carbide will be available at the outset in the complete size and shape range in which tungsten carbides are currently offered. There are apparently no inherent physical limitations as to size and shape eventually produceable. Chief current limit is the availability of processing equipment for larger sizes. Installation of equipment for larger sizes will be dependent on market demand.

Series 600 is expected to lead to the making of complete parts of chrome carbide rather than tipping as with tungsten carbide. Series 600 can be brazed, and may also be attached by mechanical means. It lends itself well to attachment by means of thermo-setting resin cements where use of such cements is feasible.



3. Among properties of Series 600 chrome carbide is its resistance to high temperature oxidation. Left to right: 18-8 stainless, chrome carbide, and tungsten carbide, originally all of identical shape and size, after exposure in air at 1850° F. for 24 hours.

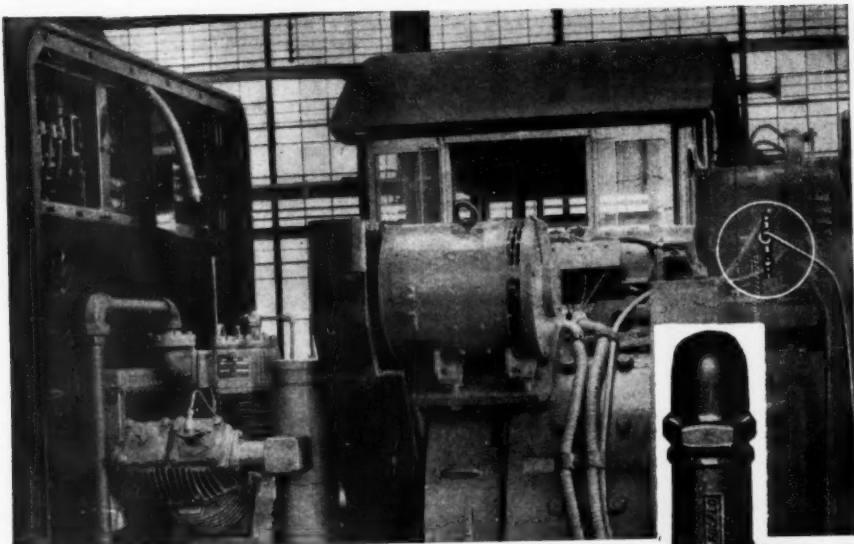
4. Series 600 presents a microstructure entirely new to the metals field. Particularly notable are uniformity of grain size and structure and the inter-locking character of the grain structure. Magnification of this illustration is 1500 diameters.



## THE MULTIFORM BENDER

PRODUCES — Springs, Stampings,  
Wire Forms, Brackets, Bus Bars,  
Clamps, etc. AT A PROFIT.  
*No Special Tooling*

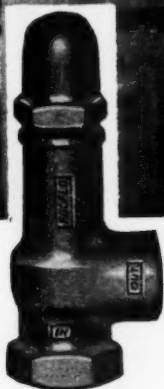
**J. A. RICHARDS CO.** KALAMAZOO  
MICHIGAN



## FULFLO VALVES DO A BIG JOB

on this Diesel Engine built by

**BALDWIN LIMA-HAMILTON CORPORATION**  
(LIMA WORKS) LIMA, OHIO



## FULFLO OIL-RELIEF BY-PASS VALVES

Precision-engineering with five springs for pressure selection  
... CHATTERLESS ... easily installed ... no further attention  
needed.

Pipe sizes: 1/4" to 2" standard pipe thread and STD  
300 lb. American flange valves 1" to 2 1/2".

Ask us ... on your letterhead ... to send your  
personal copy of the FULFLO MECHANICAL  
DATA BOOK.

THE



**Specialties Co., Inc.**  
BLANCHESTER, OHIO

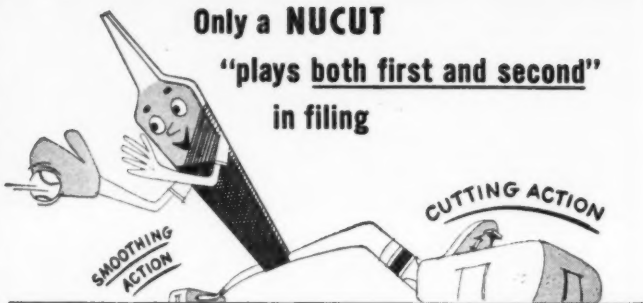


# HELLER

## NUCUT WAVY TEETH FILE

Only a NUCUT

"plays both first and second"  
in filing



1st. CUTTING ACTION

2nd. SMOOTHING ACTION

At every stroke

It's like using two files instead of one when you work with a NUCUT. For a NUCUT has *two* sets of teeth — one coarse, the other fine . . . scientifically positioned in a patented wavy pattern.

And what a difference this exclusive construction makes! The coarse teeth bite fast, clean, without scraping or skidding. The fine teeth smooth the surface *with the same stroke*. Result: better filing, faster, with less effort.

See your industrial distributor. He'll show you the sizes, shapes and cuts for getting the best results on *your* work.

### HELLER BROTHERS COMPANY

*America's Oldest File Manufacturer*

Newcomerstown, Ohio

CONTACT YOUR INDUSTRIAL DISTRIBUTOR for our FULL LINE of American Pattern, Swiss Pattern, Milled Curved-Tooth and Rotary Files, Rasps, Machinists' and Carpenters' Hammers, Blacksmiths' and Farriers' Tools, Bricklayers' and Plasterers' Trowels, Craftmaster Scrapers, Chisels, Punches, Masterrenches and other quality tools.

# 

## **engine lathes**

**for every precision turning requirement**

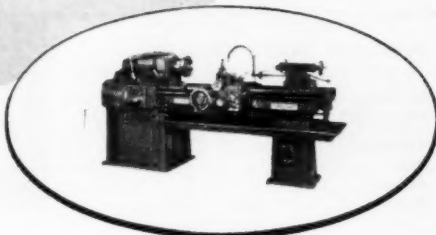
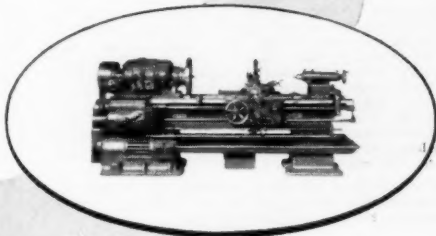
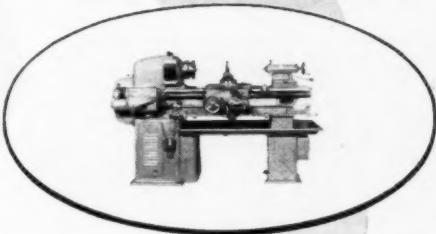
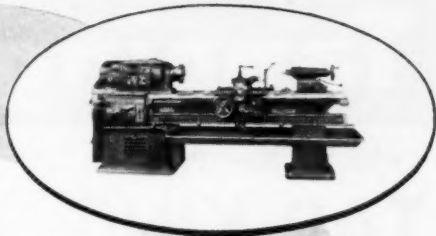
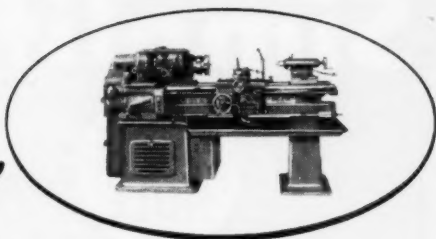


The full line of Hendey Precision Engine Lathes includes

light, medium and heavy duty models for tool and gage jobs and manufacturing work.

Hendey "plus" features include rugged construction, hardened and precision ground bed ways, convenient, simplified controls, and all the latest construction details to minimize maintenance and prolong original Hendey precision. If you're looking for the best — for life — investigate the complete line of Hendey Precision Engine Lathes!

THE HENDEY MACHINE COMPANY  
 MAIN OFFICE & PLANT: TORRINGTON, CONN.  
 BRANCH OFFICES: New York, Chicago, Boston, Detroit,  
 Rochester, Los Angeles, San Francisco  
 REPRESENTATIVES: Philadelphia, Cleveland, Pittsburgh



# Simplify

LARGE  
HOLE

# Tapping

with the New Procunier  
**TAP KING**

This lightweight, heavy duty tapping attachment was designed especially for difficult large hole tapping. Rugged, dependable, with a super-tap capacity of  $\frac{1}{4}$ " to 1" in steel and up to  $1\frac{1}{4}$ " in softer materials, the Tap King has been establishing production records. Many users report 50% production increases on large hole tap jobs and costly parts spoilage practically eliminated! And these are not isolated cases! Other users claim more spectacular daily production gains. Production men report amazing savings in parts spoilage and consistent, more accurate maintenance of uniform tap depth—even on large blind hole tapping jobs! Check these unique features:

Exclusive 17 tooth spline drive from clutch to tap holder spindle, gives smooth, powerful drive, increases tapping accuracy and reduces strain, wear and vibration; new, sensitive yet powerful friction clutch drives tap smoothly, with finger tip control—drastically reducing operator fatigue resulting in more work in less time with less effort; ball and needle bearings assure longer, trouble-free life; reverse speed is twice forward speed; simplified oiling system; aluminum housing; PLUS many other unusual features.

Write **TODAY** for circular giving full details and specifications showing how you can adapt this tapping machine to fit your particular needs.

**PROCUNIER SAFETY CHUCK CO.**  
14 S. Clinton St., Chicago 6, Ill., Dept. 12

Gentlemen:

Please send me full details on the new Procunier "TAP KING" Heavy Duty Tapping Attachment.

Name .....

Address .....

City..... Zone..... State.....



**NEW! LARGER!**  
**"TRU-GRIP"**

**Tap Holder**

Makes tapping easier close to walls or shoulders, eliminates "chewed" tap shanks. Lighter, smaller in diameter, it drives the tap by the square, holds it true by the round.

**Procunier**  
*Safety Chuck Company*

14 S. CLINTON ST. CHICAGO 6, ILL.

## It's easy to bend

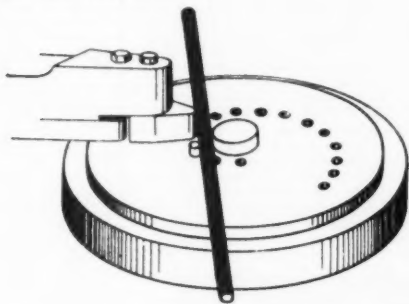
INCREASED knowledge of the cold bending of metals and recent improvements in bending machines has presented new opportunities in the manufacturing field. Many forming operations which were considered impractical in past years can now be performed without difficulty. Metal bending is a technically involved process, due to the physical change that occurs within the material during the actual bending operation, and also because the

various alloys which are available each react differently when they are formed.

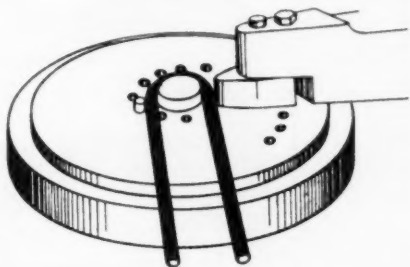
### Product Design

The actual product design usually determines whether or not the unit can be efficiently and economically produced. Selection of material is of first importance, since it must be sufficiently ductile to produce an acceptable bend at the smallest radius required, and still

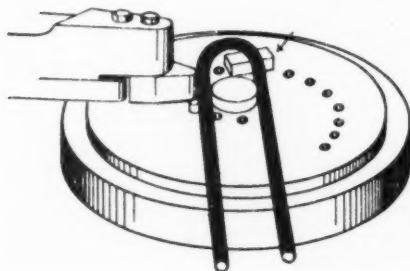
1. The operator uses both a holding pin and a radius pin which are short enough to allow the material to pass over them as the first loop is made.



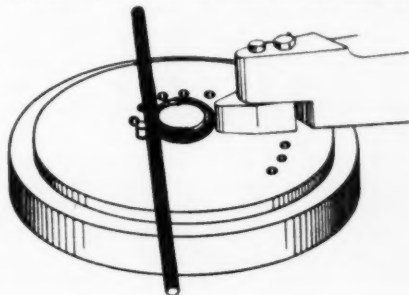
2. The operating arm of the bending machine is revolved until it strikes the angle stop, thereby completing one 180° bend.



3. The material is advanced a distance which is equal to one-half the circumference of the radius pin; then the material is tilted, using a riser block, as indicated, on the mounting plate.



4. The previously formed section will now spiral over the center pin, completing the loop. By continuously advancing the material as shown in Fig. 3, and repeating the cycle, any number of coils can be formed.





**MORTON**

# Fixture Clamps

**AND COMPONENTS**

*Be Sure..*

**SPECIFY MORTON**—Over 30 years experience in fine tool making.

Recognized throughout the industry for the development and manufacture of the most economical and highest quality Fixture Clamps and Standard Details. All precision made of heat treated selected steel. . . . . in a wide range of sizes and types to fit the most rigid and exacting requirements. . . . Complete Clamp Assemblies or any of their Component Parts.

**WRITE TODAY!** For our 72-page illustrated Catalog showing our complete line and including full size templates for tracing purposes.

**MORTON MACHINE WORKS**

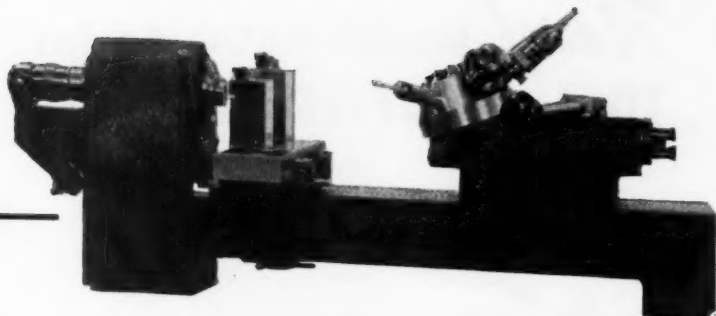
**2422 WOLCOTT • DETROIT 20, MICH.**

be strong enough to provide sufficient rigidity. The largest practical radius is preferable, since it allows more latitude in choice of material as well as assuring a better bend, both in strength and appearance.

By using the same size material, and designating identical radii for each bend whenever possible, the tooling of the bending machine can be simplified and greater production obtained, as a number of successive bends can then be

progressively made in a part, thereby completing it before it is removed from the machine.

The smallest recommended radius for tube bending, measured to the center of the tube, is  $1\frac{1}{2}$  times the o.d. of the tube, provided an inside mandrel is used when bending. This minimum centerline radius should be increased to at least  $2\frac{1}{2}$  times the o.d. of the tube if the bend is to be made without an inside mandrel.



**Produce your small precision parts with**

*Derbyshire*

**ACCURACY**

**Write for Catalog**

**Illustrated:**

No. 750 PRECISION Lathe with 22" bed; Ball Bearing Headstock with spring-bind collet closer attachment; Forming Slide Rest; Six-position Turret. Chuck capacity .004" to .315". Spindle speeds to 18,000 RPM.

**F. W. DERBYSHIRE, INC.**  
157 HIGH ST. WALTHAM 54, MASS.



**Cut grinding  
costs . . .  
with rugged  
QUEEN CITY  
Grinders**

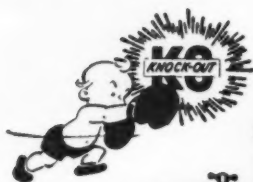
Queen City Grinders are built to stand up under the heavy work that pours through the shop daily. Noted for their durability, freedom from downtime and low cost, Queen City Grinders cut grinding costs to the bone. • Order today a battery of these low cost grinders and eliminate "ganging up" around one lone grinder.

**QUEEN CITY  
MACHINE TOOL CO.**

**QUEEN CITY  
Machine Tool Co.**  
235 E. 2nd St.  
Cincinnati 2, Ohio



# New! Model B800 Series TOOL and CUTTER GRINDERS

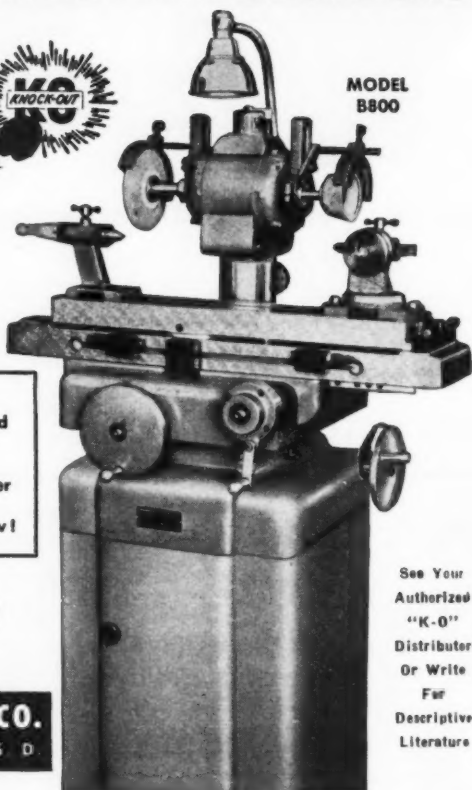


MODEL  
B800

Four  
New Improved  
Models  
of the  
Tool and Cutter  
Grinders  
Available Now!

Distributed  
Only Through  
Franchise  
Dealers

**K. O. LEE CO.**  
ABERDEEN, S. D.

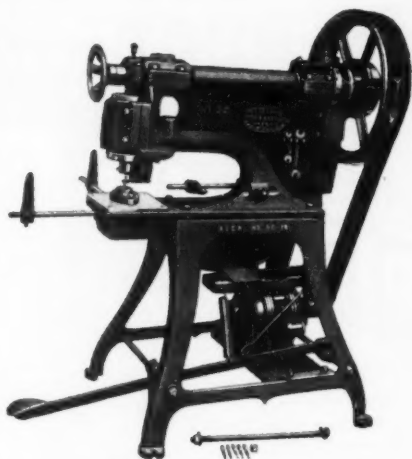


See Your  
Authorized  
"K-O"  
Distributor  
Or Write  
For  
Descriptive  
Literature

## Material Selection

Numerous types of material are available in tubing, extrusions, moldings, channels and solid bars, from which to select the most suitable material in production bending. The ductility of the material is of first consideration, and a sample should be formed to the smallest required radius in order to determine if a bend can be made satisfactorily.

Elasticity of the material should also be considered, since it may be impossible to form a closed loop or a complete circle in certain alloys. If tubing is chosen as the material from which a part is to be made, it is advisable to select the tubing with the heaviest practical wall, especially if the bend is to be made without the use of an inside mandrel; in non-ferrous metals, one quarter to one half hard tubing provides a suit-



No. 20 Deep Throat Power Punch and Press

*Write  
US ABOUT  
This Machine  
and the  
System  
of efficiency  
Punching  
Sheets in Duplicate  
Thousands  
All Over the  
World*

*There's a Reason!*

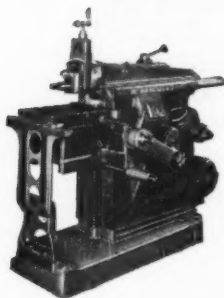
**EXCELSIOR TOOL & MACHINE CO., EAST ST. LOUIS, ILLINOIS**

**16" & 22"**

**HERCULES**

**HIGH SPEED  
PRECISION  
SHAPERS**

**ECONOMICAL • SIMPLIFIED CONTROL**



**16" Shaper**

Automatic Pressure Lubrication.

Cutting Speed Indicator.

6 Speeds, R.P.M. 26-152.

V Belt Motor Dr.

**22" Shaper**

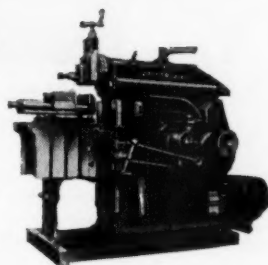
Power Downfeed

Universal Table

Cutting Speed Indicator

8 Speeds, R.P.M. 12-132.

V Belt Motor Dr.



**ATTRACTIVE DELIVERY**

*Illustrated Quotation Will Be Made Upon Request*

**PARKER MACHINE COMPANY, Inc.**

**158 PIONEER STREET**

**BROOKLYN 31, N. Y.**

Triangle 5-2103 5-2157



*Eliminates Rummaging  
Through Stacks of Drills*

No more running out of drills—your entire stock can be seen at a glance. Each size of drill has its own compartment with rounded bottom for easy selection. You can store dozens of small drills and several large ones in their own compartments. Built-in pricing or inventory system eliminates the need for cost sheets, and will keep a record of drills on hand. Stack two or three cabinets to save space. *Specifications:* 14½" long, 7¼" high, 7¼" deep. Hammerlin baked enamel finish over rugged steel.

Made in three models for fractional, number or letter drills.

**Write for Circular**

**HUOT MANUFACTURING CO.**

563 No. Wheeler St., St. Paul W4, Minn.



By the  
makers of  
**HUOT  
DRILL  
INDEX**

able result. In bending channels, angles, moldings and extrusions, the centerline radius of the bend ought to be at least three times the width of the flange to be formed edgewise.

#### **Types of bending machines**

Several bending machines are now on the market and the choice of the most suitable type can usually be determined by the range of required bending jobs. If work consists of only one specialized

operation, such as the bending of thin wall tubing on a high speed basis, an automatic bender is recommended. If jobs are so varied as to require a variety of shapes, such as tubing, angles, channels, extrusions, moldings and bus bars, as well as solids, a universal all-purpose bender would be the most suitable.

There are certain small parts bending jobs which can be formed faster and more economically with manually oper-

**GET MORE PRODUCTION OUT OF YOUR  
PRESENT POWER PRESS EQUIPMENT**



Write for Illustrated Booklet

with the

## **V&O FEED-O-MATIC POWER PRESS FEEDER**

*Installed on Any Make Press  
for Secondary Die Operations*

- Increases secondary die operation production up to 50% — 100%, and higher, with safety!
- Makes operator's job easier . . . safer.
- Increases die life.
- Requires no special dies.
- Can be set-up for new work in 1-hour, or less.

**THE V&O PRESS COMPANY**  
DIVISION OF EMHART MANUFACTURING COMPANY

**Builders of Precision  
POWER PRESSES and FEEDS  
Since 1889 HUDSON, N.Y.**

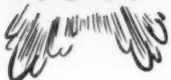
ated benders, provided the production quantities are not too great. Care in the study of specifications, capacities and the working range of various bending units enable the manufacturer to choose the most logical unit for his particular operations.

### **Special devices for bending**

All bending machines provide a means of applying power either manually or

mechanically to perform the bending operation and to supply mountings for the bending tools. These tools consist of a form or radius collar which has the same shape as the desired bend; a clamping block or locking pin that grips the material securely during the bending operation; and a forming roller or follow block which moves around the bending form. In bending materials which have open cross sections, such as tubing, channels, angles and extru-

# NEW



## MAMMOTH HEAVY-DUTY ROGERS KNIFE GRINDER



**SERIES 220**  
**200" Capacity**

Here is a new, ten ton grinder built for high production and fast grinding. It is designed to give the most precision care possible to heavy duty shear knives and production grinding of flat faces up to 210" long (Series 220 is also available in many other capacities.) Variable speed (25-50 fpm), automatic operation and magnetic chuck applications speed up grinding cycle . . . save you production dollars. Smooth table reversals, heavy-duty motors, cool operation and other Rogers features assure precision work. There's more saving and better work with the Series 220 . . . Write today!

**SAMUEL C. ROGERS & CO.**  
**207 DUTTON AVENUE                      BUFFALO, NEW YORK**  
*Pioneer Manufacturers Since 1887*

sions, the bending form should fit the contour of the material exactly in order to provide support during the forming operation. This is equally true of the clamping block and the forming roller, since only by confining the material completely can a satisfactory bend be achieved.

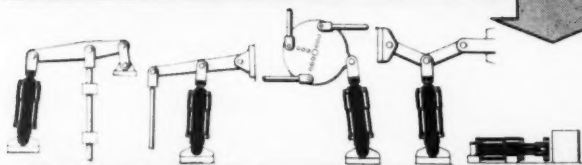
As all metals have a certain amount of elasticity, they will spring back somewhat after they are formed, therefore, the bending form should usually have

a smaller radius than the required bend. The amount of spring-back depends upon the type of material, its size and hardness, as well as the radius of the bend.

### **Bending shapes**

There is a wide variety of types of shapes of bending which can be accomplished especially with simple materials such as solid stock. This may be shaped into such complicated forms as centered

**FOR THE 1001 JOBS**



**WHERE CYLINDER POWER  
IS BEST TO USE . . .**



**HANNA CYLINDERS  
ARE THE FINEST  
YOU CAN CHOOSE!**

**Send for Catalogs**

Hanna Low Pressure Cylinders.....Cat. 236  
Hanna Hydraulic Cylinders.....Cat. 233A



**Hanna Engineering Works**

HYDRAULIC AND PNEUMATIC EQUIPMENT   CYLINDERS   VALVES   RIVETERS

1754 Elston Avenue, Chicago 22, Illinois

eyes, and off-center eyes. When using such material as flat metal strip, operations such as complete circles, zero radius bends, scroll and square bending may be successfully accomplished, always keeping in mind the elasticity of the particular material being used. In scroll and square bending, a collar having the same contour as the shape to be formed is used, adjusting the forming nose of the bender so that it is located

only the thickness of the material away from the high point of the contour collar. As the material will only bend where the contour collar offers resistance, the forming nose can lead the material around until it touches the high point, exerting enough pressure to force the material into the shape of the collar.

Solid materials, due to their ductility, lend themselves to successful bending

# 6 WEEKS!

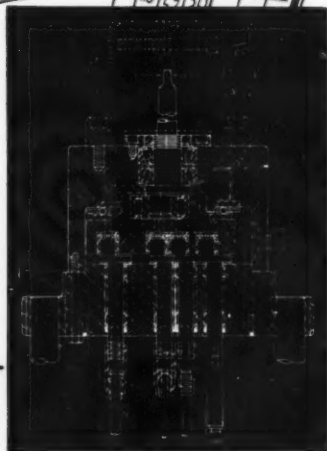


"THAT'S LIKE TOMORROW  
IN NORMAL TIMES"



*When this was  
written, we were  
giving 6 weeks  
delivery on our  
standard (and  
standardized)  
gearless drillheads*

4"  
to 15½"  
head diameter



**Maybe we can still do it! ASK US NOW!**

Ask for our Catalog B-12

**ZAGAR TOOL, INC., 24000 Lakeland Blvd., Cleveland 23, O.**

**Zagar**

**TOOLS FOR INDUSTRY  
and SPECIAL MACHINERY**

in a variety of shapes. A spring or coil can be made, for example, with the number of turns in the coil limited only by the height of the forming nose and the radius pin of the bend, and dependent also on the diameter and ductility of the stock.

#### **Loop and spiral bending**

In the series of four drawing reproduced on the first page of this article is shown how a single loop or a spiral

bend can be formed at any point in a length of material. As is seen in the first drawing, the operator uses both a holding pin and a radius pin which are short enough to allow the material to pass over them as the first loop is made. The forming nose is set so that the material will fit snugly between the nose and the radius pin. In the following sketches, the succeeding steps are described fully by the captions beneath them, resulting

## BETTER PRODUCTION from BETTER GRINDING

### MODEL "F" "STERLING" Universal TOOL and CUTTER GRINDER

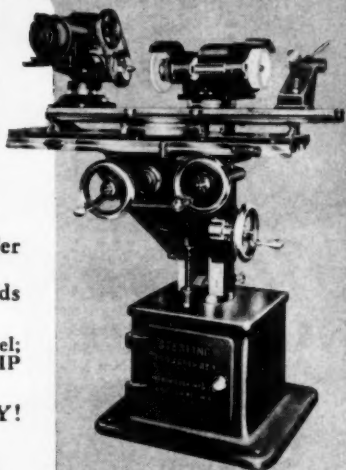
Here's a rugged, accurate Universal grinder with plenty of capacity\* at low cost.

Fast to set up; simple to operate; holds close tolerances easily.

\*10" swing; 26" between centers; 23" table travel; 8" vertical movement; 360° table rotation; ¼ HP motor; precision spindle.

INVESTIGATE the "Sterling" TODAY!  
Write for free illustrated bulletin.

**McDonough Mfg. Co.**  
1512 Galloway St. • EAU CLAIRE, WISCONSIN



Sterling Model F with  
universal workhead

## The New and Radically Different BARKER Bench-Type MILLER

With Exclusive 3-Way Hand-Lever Travel, Head, Table and Saddle.

Cutter End of Spindle Rotates in a Preloaded Double Row Ball Bearing.

Does the Work of Heavier, More Expensive Machines. Low Operation Cost.

**Easily Operated for Volume Production and Close Tolerance Work by Inexperienced Help.**

Handles a Complete Range of Conventional Milling; Profiling, Key Seating, Drilling, End Milling, Slotting and Lathe Type Operations, Such As Turning, Facing, Boring and Recessing.



Write for Literature and Information.

**THE BARKER ENGINEERING COMPANY**  
502 Green Rd. • Cleveland 21, Ohio

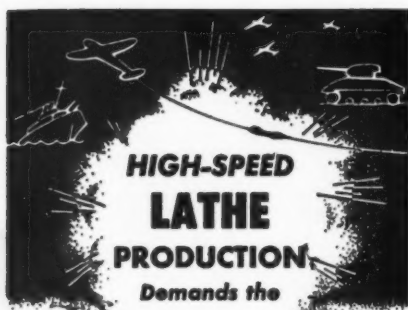


EARLY  
DELIVERY!



RIGID &  
STURDY

MODERATELY PRICED



**NO STOPPING  
NO KEYS  
NO WRENCHES  
NO PRODUCTION  
DELAYS**

Meet sudden demands for high speed production by having every lathe equipped with the Allison Collet Chuck. Gives full spindle bore capacity to any lathe having  $1\frac{1}{2}$ "-8 thread spindles. Requires no keys, wrenches, reverse switching or stopping. Operator simply draws lever ball toward him to tighten collet; pushes it away from him to release. Mail the coupon for complete, illustrated description and prices.

ALLISON CHUCK PRODUCTS  
2003 South Mesa Street  
San Pedro, California

Please send catalog page, prices and name of nearest supply house.

NAME

ADDRESS

CITY  STATE

in a perfect loop or spiral bend.

Tubing may be bent in U-shapes or S-shapes by using either a forming roller or a follow block, depending again upon the material in use. Special set-ups such as channel bending, with the flanges either in or out, may be bent successfully. By the similar methods, angles may be bent, with flange out or in. Special shaped material such as square solid bars, H-iron, U-shaped channel, or other irregular shapes may be bent according to pattern, following these and similar methods.

The extent of bending operations is dependent, naturally, upon the skill of the operator, as well as the possibilities of the bending apparatus being used. With sufficient application, however, the variety of types of bending, as well as the different shapes, are dependent more upon the ingenuity of the operator.

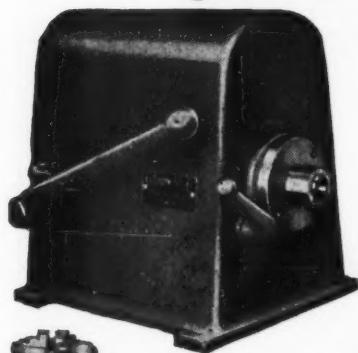
Material furnished through courtesy of O'Neil-Irwin Co., Minneapolis, Minn. A more detailed discussion of bending and bending equipment is found in their new, excellent manual, "It's Easy To Bend With Precision Bending Machines."

**The End**



"I'd like to impress upon you that this isn't just an ordinary screw driver."

# The COLBORNE SPEED LATHES



**PROMPT DELIVERIES**  
Write for Details Today

**SPEED UP FINAL OPERATIONS ON  
DIES • GEARS • SCREWS • LONG RODS**

A recent addition to the COLBORNE line of Speed Lathes is the Series 30 machine. This speed lathe is indispensable for economical polishing, grinding, burring and lapping.

Very compactly constructed to do highest quality work with the COLBORNE features of spindle bearings running in oil, instant stopping brake, easy opening collet and standard speeds of 600-920-1720-3280-4800 RPM using  $\frac{3}{4}$  H.P. motor and cone pulleys. Collets and chuck may be used.

For more production per day choose COLBORNE.

**COLBORNE MFG. COMPANY**

BUILDERS SINCE 1879

157 DIVISION ST.

CHICAGO 10, ILL.



## RED-E CENTERS

for Lathes, Grinders, Spinning, Milling,  
Railroads and Gear Cutting Machines.

Anti-Friction • High Speed • Carbide Tipped



RED-E is the **only** preferred complete line of Superaccurate Precision Centers that meet the exact requirements for Defense Production. When trouble free, efficient operation is a factor . . . choose a Red-E Center! Write for literature.

CENTER Specialists Since 1908

**RED-E TOOLS**

**READY TOOL COMPANY**

550-B IRANISTON AVE., BRIDGEPORT 8, CONN.

EXPORT DEPT.: 21 WEST ST., NEW YORK 6, N. Y.

*rely safely on* **Sidney  
Herringbone Gears**

**FOR TOOTH-TO-TOOTH ACCURACY**

**SUPERIORITY** is achieved by extreme accuracy, more tooth contact in greater strength and smoother action, with end thrust eliminated through the double opposed helix angles.

**ACCURATE TOOTH CONTOUR**, gradual engagement and oblique lines of contact assure correct tooth action and **KEEP WEAR TO A MINIMUM**. Especially suited for carbide cutting tools.



Write for details or contact  
nearest Sidney representative

**SIDNEY MACHINE TOOL COMPANY • SIDNEY, OHIO**

BUILDERS OF PRECISION MACHINERY SINCE 1904

## How to improve your plant layout and the use of equipment . . . part 2

By Dr. Thomas G. Willson

Consulting Engineer

SOME ENGINEERS estimate that 85% of labor costs in manufacturing are traceable to handling—bringing the material to the machine and putting it into the machine—taking it out of the machine and hauling it away.

There is no question but that a layout which facilitates handling, which allows for a straight line or reasonably simple flow of work in process, which allows for adequate storage space suitably located, and which permits efficient grouping of machine by type or function, will increase production and cut manufacturing costs.

Case II, illustrated in diagrams III and IV, is a good example of expensive cross-handling which was eliminated to cut costs and speed up production. This change in layout and re-routing of the flow of work did not effect the entire plant, nor did it alter the sequence or nature of production processes. Things simply happened more easily in different places than before.

The work was sheet metal fabrication of fairly large and cumbersome units used in air conditioning. Because of the materials used, and also because the size of the order did not permit mass production tooling with large jigs,

dies and other equipment, the work remained almost entirely a matter of hand operations involving a considerable degree of skill.

Some of the parts were formed on the brake press; certain others were cut from heavy stock on the router, sent over to a bench for deburring and then in either case went along to the various benches to be shaped and formed by hand, later to be placed into the parts bins along the walls as shown in Diagram III. The major steps in the manufacturing process broke down into these operations:

1. Parts from router or brakepress formed and placed in various bins
2. Preliminary assembly operations
3. Spot weld preliminary assembly
4. Hand riveting
5. Second assembly operations
6. Spot weld second assembly
7. Hand rivet second assembly
8. Final assembly
9. Final inspection operations.

The layout was inherited from previous job-shop sheet metal operations carried on in the plant, from the days when the plant had specialized in short runs of custom made articles.

**BETTER LIGHT**  
for Machine Tools,  
Assembly and Inspection Benches

# LOCALITES

*The Finest of All  
Localized Lighting Units*



**MODEL 099-PX-412**

Overall length 35½". Three instantly adjustable joints. Reflector accommodates 100 watt A-21 medium screw base lamp.

**\$13.28** EACH in pkg. of 4  
Single Units \$16.60 ea.

- **All Wiring Fully Enclosed** — completely protected from wear or insulation damage from oils and fumes
- **Adjusta-tension Joints** — tension easily adjusted for freedom of arm movement to suit worker and job
- **Universal Base** — mounts on outlet box or directly on machine or bench
- **Baked Enamel Finish** — exterior, Vista Green — Reflector interior, high temperature White

**WRITE FOR  
COMPLETE  
CATALOG** of Localized models with various type reflectors, arms and bases for every industrial use.

**THE FOSTORIA PRESSED  
STEEL CORPORATION**  
FOSTORIA, OHIO

*Localites are available  
through selected distributors  
everywhere.*



Reg. U. S. Pat. Off.

Other departments of the plant were so arranged that it was thought unwise to change the location of the receiving and shipping room and stockroom; but a door was cut into the wall back of the spot welding machine to permit materials to come through that entrance instead of through the same door from which completed goods passed out to the shipping department.

The generator and control box, as well as the router, brake press, and

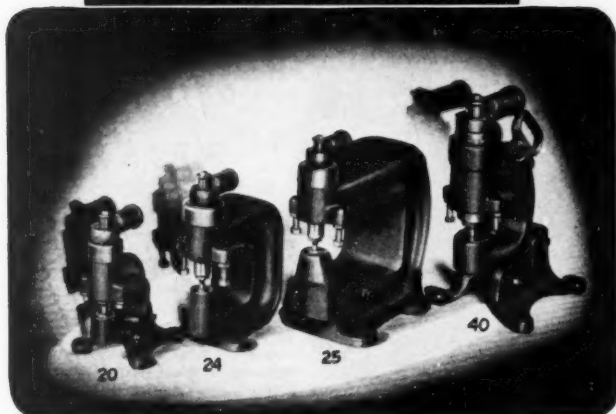
spot welder were so located with permanent installations of wiring and accessories as to make changes in their location too costly to be justified by the work in hand.

The deburring bench was moved as shown in Diagram IV, and the assembly stations consolidated more closely. The one major change which helped better the situation the most, however, was the relocation of the hand riveting operation up next to the spot welder, mov-

## WHITNEY METAL

TOOL COMPANY

39 YEARS EXPERIENCE



### WHITNEY-JENSEN

Nos. 20, 24, 25, 40

#### BALL BEARING PUNCHES

Screw press action with ball bearings in race gives tremendous punching power in comparatively lightweight tools. Nos. 20 and 40 have detachable bench bases. Ratchet handles can be furnished. See our catalog for full details.

Model	Capacity	Throat Depth
No. 20	1/2" thru 1/2"	2-1/4"
No. 24	1/2" thru 3/8"	3-1/2"
No. 25	3/8" thru 3/8"	8"
No. 40	5/8" thru 5/8"	3-1/2"

Complete line of punches and dies available.

### WHITNEY METAL TOOL COMPANY

115 FORBES STREET, ROCKFORD, ILLINOIS

ing final inspection over next to the assembly stations. The flow of work shown in Diagram IV represented a saving of from 55% to as high as 70% in the time and distance traveled by various parts to arrive at point of final inspection.

#### Foreman's part in plant layout

What are some of the things that a foreman can do to improve the layout of his department and facilitate the flow

of work? A foreman's opportunities lie along two lines: what he can do under existing layout and physical conditions and equipment; what he can do by way of changing these conditions.

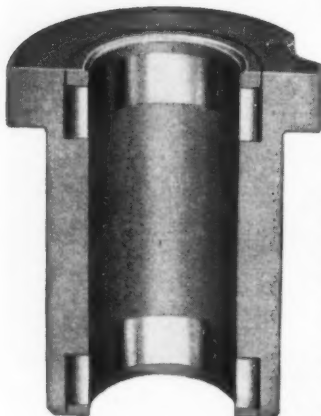
Given a definite layout as an established factor in the conditions under which a foreman must get out production, he can see to it that his equipment is kept in the best condition possible. He can do the best he can to help select new equipment. He can do the best

# SAVE MONEY 7 WAYS..

## ON PRODUCTION DRILLING!

### MEYCO

**Carbide Inserted Bushings  
Are Doing It Daily!**



\*PATENTED

For information and  
prices write for Meyco  
Bushing Catalog No. 15



**HOW?** Like this: (1) Last longer... with a life—in most cases—as long as solid carbide bushings at prices that come close to the prices of ordinary steel bushings; (2) Increased life for your drill jigs and fixtures; (3) Increased life for your drills and reamers; (4) Accuracy maintained for a LONG PERIOD of time; (5) Less non-productive machine time, less lost man hours, because bushings need not be changed as often; (6) Inspection time saved, because of greater accuracy for a longer time; and (7) Less waste due to spoilage, for the same reason. Don't pass up a good bet! Get the dope on MEYCO Carbide Inserted Drill Jig Bushings today!

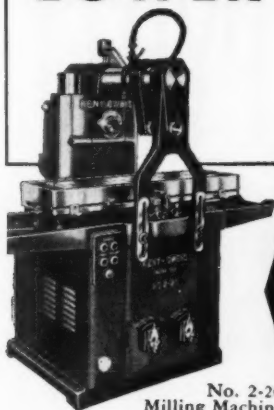
W. F. MEYERS CO., INC., BEDFORD, INDIANA

he can with manpower available to put the right man or woman on the right job. He can watch methods of production to see that work is performed satisfactorily with the least possible number of operations, and with the least handling of parts and materials. He should not only try to keep sufficient workers on hand at all times, but also see that sufficient parts and proper materials arrive at the proper places for use at the desired times so that there will be

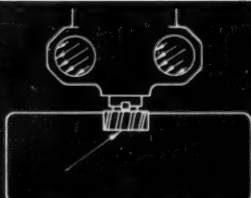
little or no lagging in the flow. Departmental housekeeping, keeping aisles clear and tools and materials in their proper places, plays an important part in this phase of departmental efficiency. He must avoid excessive and unnecessary machine changes or set-ups, and see to it that machines are set up sufficiently in advance so that adequately long runs may be made with that particular set-up.

When it comes to the foreman doing

## LOWER MILLING COSTS!



No. 2-20  
Milling Machine  
Table, 42" x 12"  
Table travel, 20"



**TWIN POST MOUNTING.** Head mounted on two cylindrical ground steel posts which carry spindle midway between them — extra rigidity — an exclusive Kent-Owens feature!

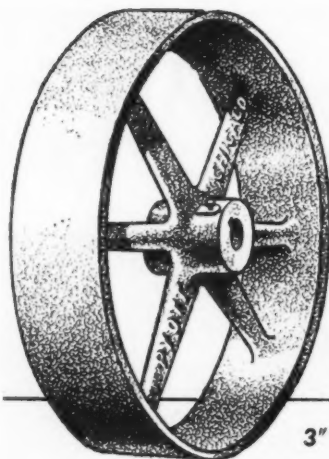
Kent-Owens builds 'em *rugged . . . simple . . . and versatile . . .* machines adaptable to countless milling jobs. Designed for rapid, easy set-up and cost-saving operation. Extra rigid head mounting assures balanced load. Greater cutting efficiency with smooth, powerful cutter drive—only two gear contacts, motor to cutter. Write for bulletins on wide range of hydraulic and hand-operated machines. Kent-Owens Machines Co., Toledo, Ohio.

## KENT-OWENS

### *Milling Machines*

something to change the existing shop layout, he has several things to keep in mind. In general, the material should go in as direct a line as possible toward some predetermined center. The layout should be such that the distance from one operating point to the next is as short as possible. This facilitates and cheapens transportation. A cheap movement of material, however, should not be attained at the expense of operating

comfort for the workers; nor of overloaded or underloaded equipment. This is right from a plant morale point of view as well as from the angle of efficiency in uncrowded machine operation. The distance between operating points should not be so close as to leave inadequate room for the placing of material. Experience shows that finished stock suffers damage when quarters are too crowded.



# CALL ON PYOTT

for Cast Iron  
**PULLEYS**

**3" to 102" DIAMETERS**

Pyott can meet your cast iron pulley requirements promptly. Available types include split and solid hub, single and multiple arm, wide and narrow face, flanged, tapered and step cone as well as tight and ball bearing loose pulleys. All are perfectly balanced and may be operated at running speeds up to 6000 FPM, depending on diameter and type of pulley. Pyott Cast Iron Pulleys are machine molded up to 72" diameter and 24" face width. Larger sizes or unusual designs floor molded, requiring no patterns from pulley user. With your inquiry, send a dimensional sketch and indicate your delivery requirements.

*Catalog available on request*

## **PYOTT FOUNDRY & MACHINE CO.**

Established 1896 • 327 N. Sangamon St., Chicago 7, Illinois

### **Balanced layout**

It is necessary in any grouping of machines to have the layout so balanced that the right number of machines can take up the work produced by prior operations and pass it on to succeeding operations in an amount which is neither excessive nor insufficient. Otherwise the work will slow up or stop completely at certain points. These bottlenecks are costly, because they tie

up expensive materials, demoralize assembling, delay shipment, utilize valuable floor space with material piled around, necessitate overtime work to regain the balance of production.

A balanced layout compels attention to the floor space around a machine. There must be adequate room for the operator to work; space must be provided for storage of incoming material



**THIS  
SIMPLE DEVICE**

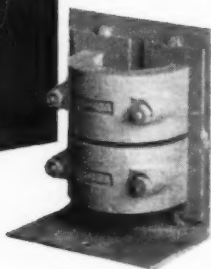
*will greatly speed up  
feeding stacked  
steel sheets into  
presses, brakes  
and shears*

ASK  
FOR  
BULLETIN  
SF-2

TRADE **Verson** MARK

**SHEET FLOATERS**

WITHOUT tools, electricity or air, Verson Sheet Floaters separate stacked steel sheets or blanks in a manner that makes it easy for operators to grasp the top piece and feed it into the machine. Saves time, money and manpower. Write for descriptive literature.



**VERSON ALLSTEEL PRESS CO.**

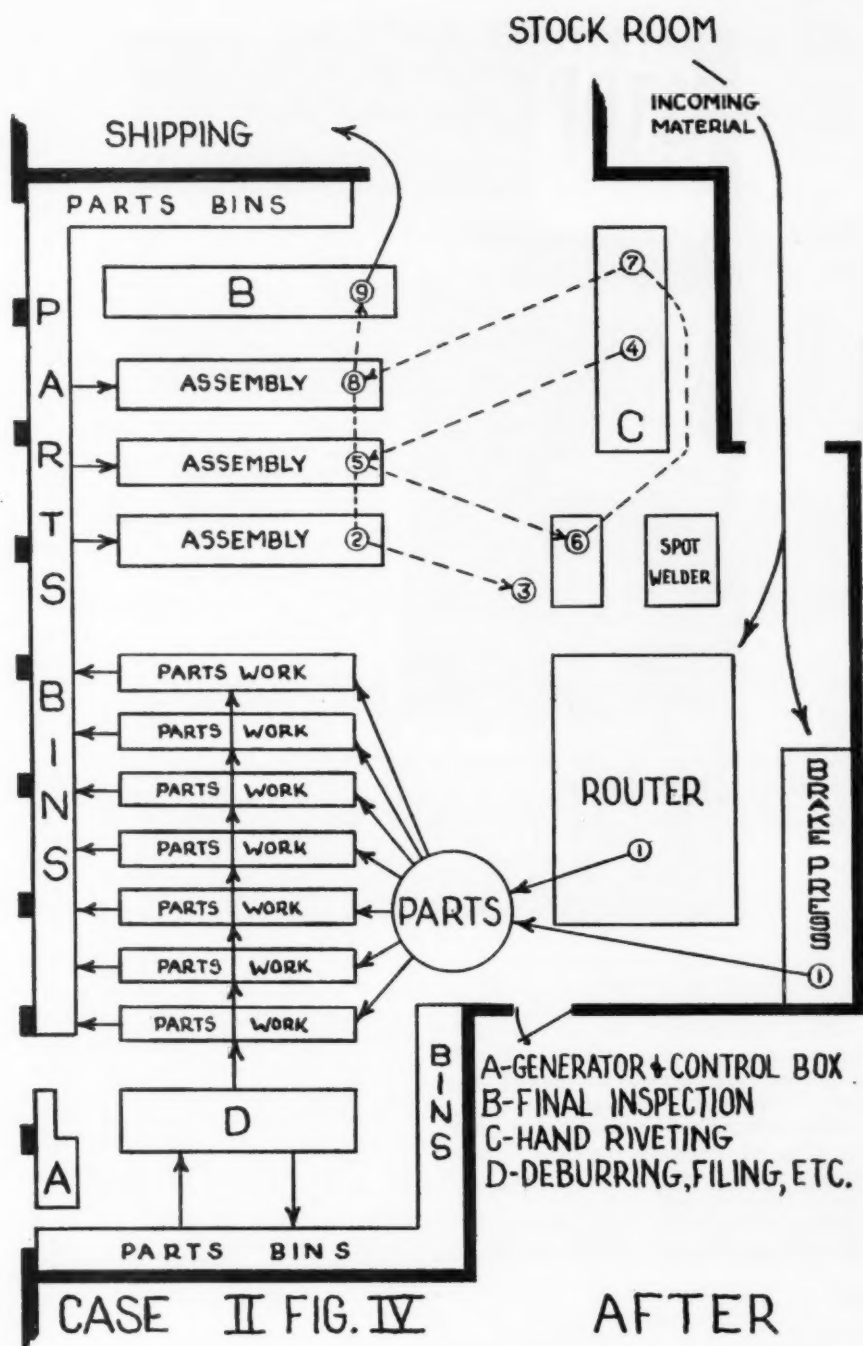
9303 South Kenwood Avenue  
CHICAGO 19, ILLINOIS

So. Lamar at Ledbetter Dr.  
DALLAS 15, TEXAS

**THERE'S A Verson PRESS FOR EVERY JOB  
FROM 15 TONS UP**

and for parts completed; provision must be made for tool vise or bench room if the work requires it, and room must be assigned to adequately and conveniently hold attachments and other accessories. In the general scheme of the plant layout, the machine itself cannot be considered as the unit of production, but the standard used instead must be the complete and efficient operating zone or area.

The planning of the layout for the flow of work requires close attention to the methods of transportation available, weight and size of objects to be transported, frequency of movement. There should be an inflexible rule that the main aisles are to be kept clear at all times, and the aisle spaces should be defined clearly with painted lines on the floor or some other device. Trucks not in use should be left in allotted



**STOP** making your own punches

WE'LL MAKE ANY PUNCH AT A PRICE BELOW YOUR OWN COST!

**precision punches pivot punch**

for EVERY purpose from ONE dependable SOURCE

• More than 276,000,000 Standard Sizes and Styles at Standard Prices

**pivot punch**

DIVISION OF PIVOT PUNCH AND DIE CORPORATION  
NORTH TAVENERS, N. Y.

- The only one stop Punch Source.
- More than a Punch. It's a Punch Service!
- No Need to Stop to Standardize. 276,000,000 sizes and styles at standard catalog prices. No hidden prices for "in-Between" Sizes.
- Any Type of Punch in a Choice of Four Qualities. A punch for every purpose — a punch for every cost at prices below your own cost to manufacture.

SEND FOR NEW FREE CATALOG. WRITE DEPT. 4

**ONE SOURCE FOR ALL OF YOUR PUNCHES**

**pivot punch**

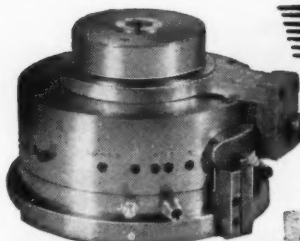
DIVISION OF PIVOT PUNCH AND DIE CORPORATION  
NORTH TAVENERS, N. Y.



floor space of their own and not allowed to be parked at random where they might interfere with production.

Many shops which do not use the newer kinds of transportation methods might well give serious thought to the practicability of installing some such means to facilitate the flow of work and handling of material. Gravity chutes, hoists, conveyors, electric trucks, inclined runways, and other devices offer practical assistance in advancing the material rapidly from point to point.

One plant, for lack of time and available materials for more extensive conveying apparatus, made a simple assembly line conveyor of ordinary window sash rollers fixed into a series of long work benches down which the work was passed. Adaptations of the familiar piano movers' "dolly" have many uses. A little ingenuity can go a long way toward making things move faster with less wear and tear on backs and feet. End of part 2.



RC-5



## INDEX CHUCK

### with Air Operated Collet

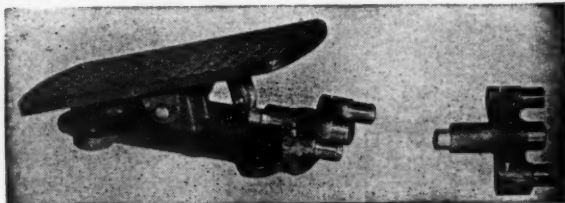
Uses Brown & Sharpe type collets. Capacity: 1/16" to 2".

No. FC-28

V-29

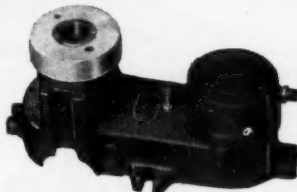


**Air Foot Control  
and Valve**



## COLLET AIR CHUCK

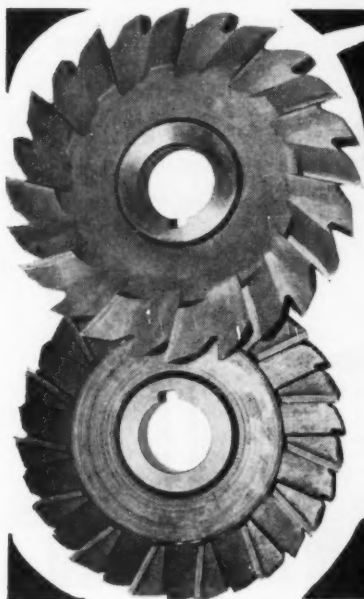
Uses Brown & Sharpe type collets. Capacity 1/16" to 3 1/2".  
Write for literature and prices



**REDMER AIR DEVICE CORPORATION**

BOX 247

GUNTERSVILLE, ALABAMA



## New CUTTERS

FROM YOUR OLD TOOLS AT A  
FRACTION OF NEW TOOL COST

### GUARANTEED NEW TOOL PERFORMANCE

Let us quote on the manufacture of special tools, both high speed and carbide. We can also produce specials to your blueprint specifications from our large stock of standard tools. Rush your blueprints to us for immediate quotation!

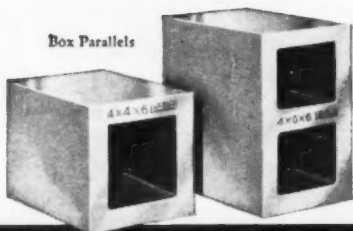
**TAKE ADVANTAGE OF OUR EFFICIENT  
TOOL SHARPENING SERVICE!  
ALSO REPAIRING OF CARBIDE TOOLS.**



**MANUFACTURERS CUTTER CORP.**

273 JEFFERSON ST. • NEWARK 5, NEW JERSEY

Box Parallels



5" Sine Bar

## WHEN YOU WANT HIGHEST PRECISION

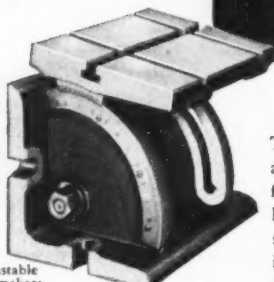
*In Inspection and  
Production Tools*

### ... Specify TAFT-PEIRCE

Taft-Peirce Inspection and Production tools are designed and built to the quality standards of the world's most famous toolroom. The finest grades of alloy steel, careful heat treatment, exact finishing produce unequaled precision — the precision you require to ensure true accuracy in your set-up, layout, and inspection work. For further information on these and many other aids to manufacture,

write today for your copy of the new  
Taft-Peirce Handbook.

Adjustable  
Toolmakers  
Knee

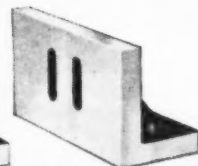
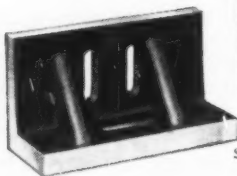


Surface Plate

### The TAFT-PEIRCE Manufacturing Company

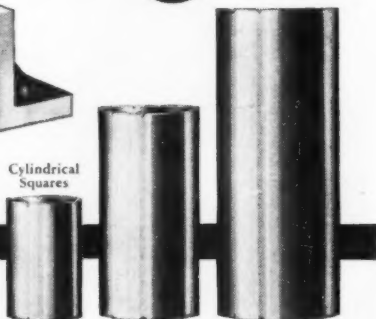
WOONSOCKET

RHODE ISLAND



Slotted Angle  
Irons

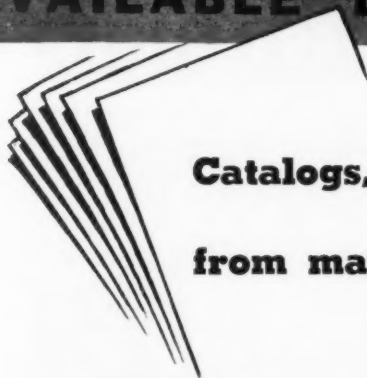
Cylindrical  
Squares



**TP means TOP PRECISION**

# AVAILABLE LITERATURE

DECEMBER, 1951



## Catalogs, bulletins available from manufacturers

**1. How A Recently-Developed Metal-Cleaning Material Removes Oil and Rust** in one operation, also prepares steel and aluminum for painting, is described in this booklet. Oakite Compound No. 33 has solvent and detergent properties which are markedly effective in removing stamping and forming oils, rust preventives, carbon smuts, soldering and welding fluxes, identification inks, etc. **Oakite Products, Inc., 157 Thames St., New York 6, N. Y.**

**2. Assistance In Solving Problems Involving The Use Of Alternate Grades Of Medium Carbon or full hardening grades of tubing steels** is offered in 4-page Bulletin TDC 141 which presents condensed data on microstructure, critical points, effect of alloy elements, forging machining, welding, and thermal treatment for 14 well-known alloy steels used in the production of tubular parts. **Babcock & Wilcox Tube Co., Beaver Falls, Pa.**

**3. Manual of Cerromatrix Method of Punch and Die Setting** offers 20 pages of practical information regarding the application of this method in making various types of dies. Illustrated with photographs and drawings. **Cerro De Pasco Corp., 40 Wall St., New York 5, N. Y.**

**4. "Ryerson Threaded Bar Service"** gives data on size range, lengths, kind of

threads, bending, and types and finishes of steel bars that are furnished threaded. The bulletin also illustrates some of the accessories that are furnished, including turnbuckles, nuts, washers and tank lugs. **Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.**

**5. The Complete Line of Portable Roller and Wheel Conveyors** are illustrated in this catalog which includes conveyor specifications and explains erection problems and how to determine your conveyor requirements. 28 large illustrations with explanatory foot notes are provided to give the reader a wide range of application views. Bulletin No. 15 available from **E. W. Buschman Co., Cincinnati 32, O.**

**6. "Blueprints for Faster, Better Production"** describes in detail coated abrasive specialties and solid abrasive oilstone specialties designed for the metal finishing fields. Contained in a folding cover that can be expanded into a permanent wall chart, "blueprint" case study discussions of individual finishing problems and their solutions are graphically presented. **Behr-Manning, Troy, N. Y.**

**7. Horizontal, Boring, Drilling and Milling Machines Catalog** illustrates and explains mechanical characteristics, construction and operating details of these machines, which feature large

## KNU-VISE CLAMPS PROVIDE UNUSUAL VERSATILITY

*What goes  
on here!*

Toggle bars can be made adaptable for diverse applications—plain or with various end treatments to suit your job at hand.

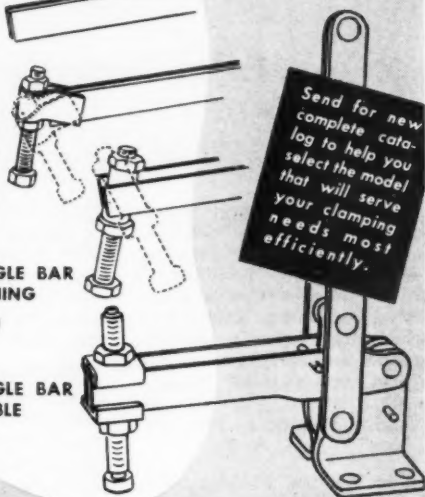
**SOLID TOGGLE BAR**

**SOLID TOGGLE BAR FOR BOLT RETAINER**

to facilitate angle holding

**CHANNEL TOGGLE BAR FOR BOLT BUSHING**  
for angle holding

**CHANNEL TOGGLE BAR WITH ADJUSTABLE SPINDLE**



Sales offices in principal cities.

**KNU-VISE  
PRODUCTS**

**LAPEER MFG. CO.**

**3052 DAVISON ROAD • LAPEER, MICHIGAN**

**WESTERN DIVISION: 422 Magnolia Street, Glendale, California**

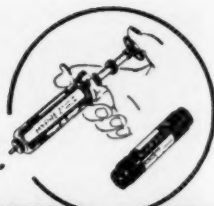
dials for easy reading to one thousandth of an inch. Includes details on vertical and horizontal attachments as well as scan-a-scale with microscope. **Portage Machine Co., 1037 Sweitzer Ave., Akron, O.**

**8. Reference Handbook For The Drill Bushing Industry** besides serving as a catalog has many features never before published. Among these are the copyrighted comparison tables which provide instant cross references to some

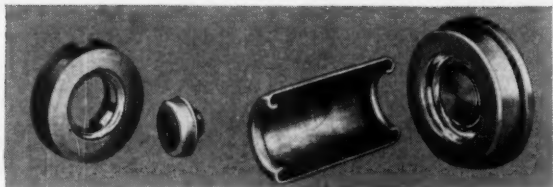
3,023 symbols used by other leading manufacturers. These tables compare their many symbols to actual A.S.A. standard sizes and specifications as used by Ace. **Ace Drill Bushing Co., 5401 Fountain Ave., Los Angeles 29, Calif.**

**9. Reference Booklet on Copper and Copper-Alloy Die Pressed Forgings** provides practical, to-the-point, comparative illustrations to show what die pressed forgings are . . . what they can

**A TOUGH  
METAL-FORMING  
JOB...licked with...**



## **HYPREZ DIAMOND COMPOUNDS**



Bearing seats in seamless tube (cut-away section shown) and outer bearing race formed in dies of flawless Hyprez polish and precise contour—a quick method to perfect die performance.

### **For Finer, Faster Finishes on Dies, Molds, Tools**

Hyprez Diamond Compounds are available in 26 engineered grades—in 18 and 5 gram color-identified cartridges for use with the Hyprez Applicator Gun

Write for instructive Technique Folder  
or free demonstration to Dept. B-1251.

## **HYPREZ DIVISION ENGIS EQUIPMENT CO.**

431 S. DEARBORN ST.

CHICAGO 5, ILL.

do . . . what they have already done . . . what a manufacturer can expect of them. 12-page booklet contains tabulation of physical properties of copper and copper alloys suitable for forgings. **American Brass Co., Dept. DPF, Waterbury 20, Conn.**

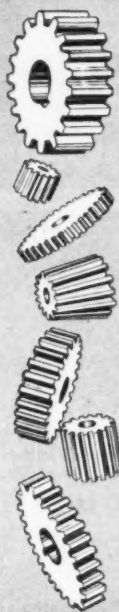
**10. DoAll Taps** are presented in 16-page catalog No. 51-813 which includes illustrations and specifications on hand, machine screw, nut, pulley, pipe, tapper, hook and special taps, plus 9 pages of

technical data and suggestions for ordering taps. **DoAll Co., 254 N. Laurel, Des Plaines, Ill.**

**11. Pres-Sure-Connectors For Solderless Splicing and Terminating of Electrical Wires** are described in 4-page Bulletin 750. Contains detailed descriptive data, installation instructions and ordering information. **Buchanan Electrical Prods. Corp., Hillside, N. J.**

**12. The Arter Imperia Carbide Tool Grinder Model 200** offers a new method

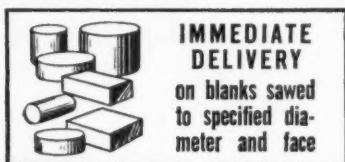
# GREAVES-SILENT BAKELITE GEARS



## THEY'RE STRONG, SILENT!

You'll appreciate the smooth, silent operation of Greaves-Silent Bakelite Gears. You'll marvel at the big power loads they can carry . . . and their remarkable ability to operate successfully when completely submerged in water. Cost is low so you'll save plenty of time, money and labor. Silent gears of rawhide and Fabril also available.

### • WRITE FOR CIRCULAR



#### IMMEDIATE DELIVERY

on blanks sawed  
to specified dia-  
meter and face



## GREAVES

**THE GREAVES MACHINE TOOL CO.**

2600 EASTERN AVE. CINCINNATI 2, OHIO

of grinding carbide tools by which tools are repeatedly ground to the specified angles, which have become so very important in obtaining satisfactory performance and longer tool life between grinds. For further information, write the Arter Grinding Machine Co., Worcester 5, Mass.

**13. Nupla Hammers**, engineered to fill all soft-face needs, will not gash, mushroom or chip, will not mar or damage delicate painted, polished, or plated surfaces. More durable than other plas-

tic materials, they are safety tools with no explosion or fire hazard. 4-page folder pictorially describes types and uses. **New Plastic Corp.**, 1041 N. Orange Dr., Los Angeles 38, Calif.

**14. The Hobby No. 21-P Diameter Rule** measures diameters up to 21 inches, gives accurate direct-line, normal left-to-right reading, eliminates unusual reading or need for mathematical adjustments. Clearly marked with  $\frac{1}{4}$ ",  $\frac{1}{2}$ " and  $\frac{3}{4}$ " figures between the inch numerals. It is also a regular 6-foot

DRILLING LARGE HOLES FROM THE SOLID?  
**Send for this Catalog Today!**

**INTERCHANGEABLE**

8 sizes of HOLDERS for  
256 sizes of CUTTERS  
1 1/4" to 5" diameter

**Conner**  
SPADE DRILLS  
& CORE DRILLS

**IMMEDIATE DELIVERY**  
on all CONNER Standard Tools

-----  
**CONNER TOOL & CUTTER CO., 1000 E. McNichols Rd., Detroit 3, Mich.**

*Please send me your new spade drill catalog immediately . . . . .*

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

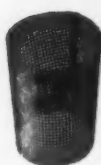
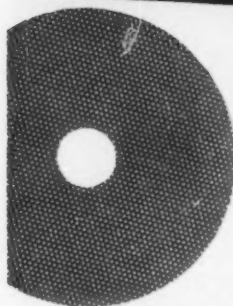
steel tape graduated in 16ths for quick, accurate linear measurements. **Carlson & Sullivan, Inc., 1714 California Ave., Monrovia, Calif.**

**15. The Speed Vise** features quick action design, screw and nut hardened steel, heavy semi-steel castings, heavy steel base plate, standardized holes in jaw. It is a quick-acting clamping mechanism which will accommodate a wide variety of parts. **Cardinal Machine Co., Glendale, Calif.**

**16. K-J Quick Change Lathe Tools** simplify and facilitate engine lathe tooling and production. These tools make possible all operation changes without the use of wrenches; fine height adjustment of all tools is maintained regardless of change of tools from one operation to another; tool changes are made in a few seconds. Illustrated and described in 8-page folder available from **Bigg Stava Co., 1627 W. Pico Blvd., Los Angeles 15, Calif.**

## Perforated METALS

**Fabricated, Too!  
at H & K**



- Limitless Pattern Variety
- Uniform Hole Sizes and Spacings
- Forming Assistance and Facilities

FOR THOSE SPECIAL APPLICATIONS where Perforated Metals must take special form (filter plates, trays, conveyor linings, automotive radiator grills and such), H & K offers complete fabricating facilities PLUS the experience of 68 years in precision perforating. H & K is fully equipped to roll, shear, braze, weld and otherwise fabricate to your specifications.

H & K RECOMMENDATIONS will be based on the most suitable metals, alloys (non-metals, too) available with all the desirable features of corrosion resistance, strength, smooth easily cleaned surfaces, dependably accurate patterns, etc., at low cost.

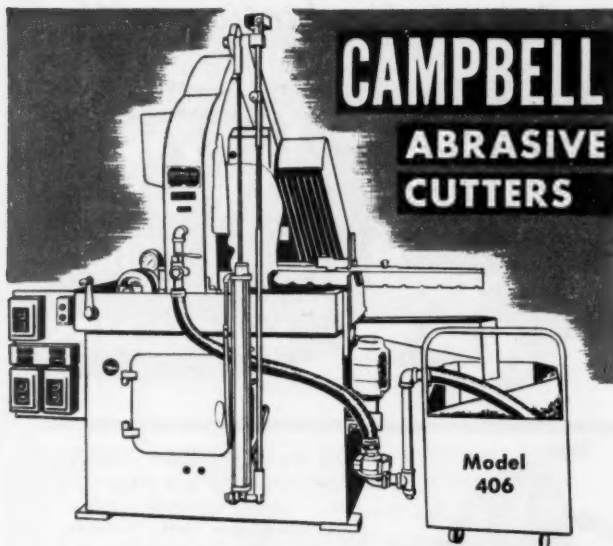
Also remember—H & K Grilles . . . Ultimate in Beauty . . . Utility . . . LONG LIFE!

**The  
Harrington & King  
PERFORATING CO.**

5635 FILLMORE ST., CHICAGO 44, ILLINOIS  
114 LIBERTY ST., NEW YORK 6, N. Y.

17. Fiske's C.S.A. No. 2 Cutting Oil furnishes just the right bite and contains a sufficient amount of lubrication to permit the desired higher speeds without tearing work. Send for folder which also describes Majestic Soluble Oil for rolling aluminum ingots from large rolls to continuous mills where sheets or plates are further reduced, and Magic Compound for wire drawing, forming and stamping. **Fiske Bros. Refining Co., 129 Lockwood St., Newark 5, N. J.**

18. The Complete Adamas Line is illustrated in color in 20-page catalog No. A-851. Sections on standard blank styles; reamer blanks, solid ground cylinders, rectangular strips, standard bushings, solid carbide inserts and modified and semi-standard blanks. Also includes brazing techniques, grade selection guide listing standard, special, wear and impact grades and their Rockwell "A" hardnesses. **Adamas Carbide Corp., 1000 S. Fourth St., Harrison, N. J.**



### Ready for the Emergency

- A complete line for cutting all metals—ferrous or non-ferrous—hard or soft. Re-engineered for higher production performance and lower over-all cost. Many automatic features. Cutting disc enclosed in steel guard. The safest abrasive cut-off machine made.

**Write for "Campbell Explains Abrasive Cutting"**  
**ACCO** Tell us your problem—  
we'll make recommendations



CAMPBELL MACHINE DIVISION  
AMERICAN CHAIN & CABLE

937 Connecticut Ave., Bridgeport, Conn.

19. The Curtiss Adjustable Fixture is perfect for single piece, small, medium and large lot production of parts of such shape and design that chucking or face plate holding is neither practicable nor possible. It can be used for first, second, or later operation work, and where close tolerances are to be held in relation to previous machining. Curtiss Engrg. Co., Harvey, Ill.

20. High Speed Hydraulic Copying Lathes are specifically designed for

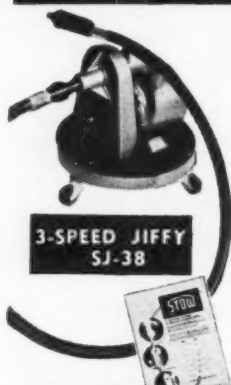
carbide and diamond tools. Copy-turns from flat template or turned master; optimum spindle speeds for carbide tools up to 3,600 r.p.m.; deep heavy bed and massive one-piece base; two sliding motions between bed and cutting tool; no flexible oil pipes to get damaged or to cause obstructions. H-E-B Machine Tools, Inc., 341 Madison Ave., New York 17, N. Y.

21. "People Work Better When They See Better" describes the Magni-Focuser,

*step up production with*



**STOW**  
flexible shaft  
**MACHINES**



These dependable STOW FLEXIBLE SHAFT MACHINES save production time . . . speed up output . . . help lower production costs. Variable Speed Models shown are easily portable . . . cut down operator fatigue and increase on the job efficiency!

Constant Speed Models available. Also complete line of accessories designed to increase the utility of STOW Flexible Shaft Machines!

**WRITE TODAY**

for your free copy of CATALOG 51

**STOW**

Manufacturing Co., Inc.,  
30 Shear St., Binghamton, N. Y.

the binocular magnifier. The Magni-Focuser shows an object greatly magnified with the depth and clarity of normal vision; reduces eye-strain and relaxes the user; increases accuracy, and minimizes the chance of errors or accidents. Edroy Products Co., 480 Lexington Ave., New York 17, N. Y.

22. Abart Speed Reducers and Right Angle Gear Motors are shown in a 96-page pocket-size catalog which gives complete engineering data on how to

select the proper speed reducer to fit requirements, including horsepower ratings, ratios and installation graphs. Abart Gear & Machine Co., 4834 W. 16th St., Chicago 50, Ill.

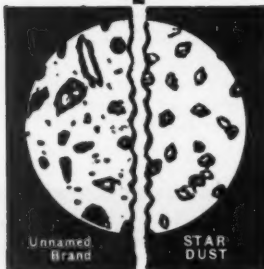
23. Abrasive-Belt Machine Catalog, in addition to giving a comprehensive description of each machine, its operation and the scope of its uses, is a basic manual on the subject. 28-page Form No. 400 available from the Porter-Cable Machine Co., Syracuse 8, N. Y.

You're LAPS AHEAD with

ACE *Star Dust* ★  
DIAMOND LAPPING COMPOUNDS  
AND DIAMOND POWDERS

Laboratory  
Grading  
Does it!

MIRROR FINISHES IN MINUTES ON DIES,  
TOOLS, MOLDS AND PRECISION PARTS



ACTUAL MICROPHOTOS PROVE  
STAR DUST SUPERIORITY AT  
A GLANCE . . .

STAR DUST is so accurately crushed and graded by Ace's new laboratory method that it achieves uniform nodular shape, permitting all particles to work. Thus you are assured finishes of less than half a micro inch, quicker than ever before. By contrast, note lack of uniformity and the flats in the "unnamed" brand that prevent accurate finishing!

● STAR DUST USERS REPORT AVERAGE SAVINGS IN POLISHING TIME OF MORE THAN 78%: Available in ophthalmic-tipped tubes or in new applicator gun that delivers minimum quantities to individual jobs and eliminates all waste . . . In all grit sizes as fine as .0001".

Write today for informative bulletin No. A-12

ACE ABRASIVE  
LABORATORIES

250 WEST 57th STREET  
NEW YORK 19, N. Y.

24. Allegheny "Steelband" Strapping, Seals, Tensioners, Sealers, and accessories, used for banding all types of packages, bales, boxes, bundles, and pallets, are illustrated and described in a 6-page folder published by Allegheny Steel Band Co., Box 716, Pittsburgh 30, Pa.

25. 28 Models of Air Cylinders, each in nine bore diameters, are illustrated and described in Catalog Section No. 55 which lists every standard air cylinder

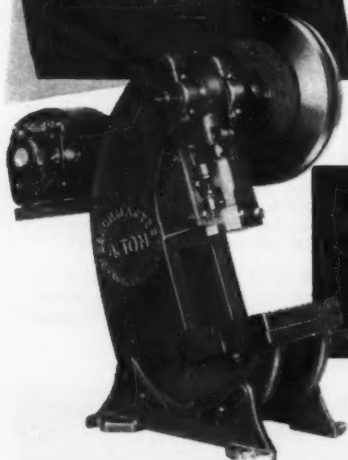
offered in the industry. Working drawings and specifications are furnished for each model and size cylinder, both standard and cushioned types, single and double end rods, internal and external threads. Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass.

26. Automatic Press Room Equipment Catalog illustrates and describes slide feeds, roll feeds, stock straighteners, stock reels and coil cradles, for use in connection with punch presses. Bulletin

**benchmaster**

**ECONOMY  
PROVED AGAIN!**

**5  
Benchmasters  
COST LESS  
THAN 1!**



One operator used his Benchmaster press for all 5 stages of a forming operation. Die changes and set-ups proved costly—both in time and lost production. NOW —5 Benchmasters do the same job, each handling a separate stage. Tooling is never changed or removed. Savings in time and extra output have paid off the entire cost and continue to pay a high dividend on a low investment!

*There's a low-cost Benchmaster for every requirement—1 Ton, 4 Ton, 7½ Ton and Deep Throat models. Write for literature or see your dealer.*

**benchmaster**

**PUNCH PRESSES AND MILLERS**

2952 W. Pice Blvd.,  
Los Angeles 6, California

*World's largest manufacturer  
of small punch presses and  
milling machines.*

No. 80 available from the U. S. Tool Co., Inc., Ampere (East Orange), N. J.

**27. All-Chemical Cutting Fluid** booklet covers in detail properties of the coolant, elimination of dermatitis and odor, elimination of cleaning and degreasing operations before painting, plating or assembly; it contains complete information on cleaning of machines, mixing and maintenance of coolant solutions, plus case histories of the product in use in almost every type of metalworking

operation. Write F. E. Anderson Oil Co., Portland, Conn.

**28. Power Tools** for cutting, shaping, drilling and finishing wood, metal, fibre and plastics, are the subject of the 48-page catalog. Illustrated and fully described are jointers, planers, band saws, contour saws, drill presses, band filers grinders, jig saws, lathes, belt sanders, spindle sanders, shapers, tilting-arbor saws and saw jointers. **Boice-Crane Co.**, 936 Central Ave., Toledo 6, O.

## Deburring with NOBUR tool

on drill press reduces  
production costs . . . speeds  
deliveries!

### MEMO

TO: Planning Dept.  
FROM: Methods Engineer

NOTE: 75% saving in  
time on Op.#4 and  
16% in overall time.

Let's take fuller  
advantage of  
**NOBUR**

FG. CO.

OUTLINE

OPER NO.	MACHINE	DESCRIPTION	TIME
1	TURRET	BORE & FACE PER PRINT	5 MIN
2	MILL	STRADDLE MILL PER PRINT	3
3	DRILL	10 HOLES LINE DRILL	6
4	BENCH	DE-BURR HOLES	4
4 (REV)	NOBUR TOOL IN DRILL PRESS	NOBUR HOLES	1
TOTAL			18 15

For further information, write or wire today

**NOBUR MANUFACTURING COMPANY**

717 NORTH VICTORY BLVD. • BURBANK, CALIFORNIA

29. Capewell Catalog and Price Book lists the complete line of hand and power hack saw blades, metal and wood cutting band saws, band knives, Armstrong-Bridgeport pipe fitters' hand tools, pipe and bolt threading machines, hammers, ground flat stock, foundry nails and horse nails. Capewell Mfg. Co., 60 Governor St., Hartford, Conn.

30. The New Vitrified Silicion Carbide Grinding Wheel Bond, "XL," is described in a 4-page folder which gives

details on applications and advantages of using "XL" bonded wheels for tungsten carbide tool grinding, plus specifications of the most popular straight and cup wheel sizes for rough and finish grinding. Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago 7, Ill.

William B. Pierce has been elected as vice president of Allegheny Ludlum Steel Corporation, Pittsburgh 22, Pa., recently.

# 3 HI-SPEED AUTOMATIC PRESSES

5 TON      8 TON      12 TON

CLUTCH  
AND  
AUTOMATIC  
BRAKE  
RELEASE

FAST  
EFFICIENT  
ACCURATE

POSITIVE  
KNOCKOUT  
FOR  
COMPOUND  
DIES

SINGLE  
OR  
DOUBLE  
FEEDS

CYLINDER  
TYPE RAMS,  
ADJUSTABLE  
BRONZE  
SLEEVE

VARIABLE  
SPEED  
DRIVE

*Write*  
**DI MACHINE CORP.**

2712 W. IRVING PARK RD.      CHICAGO 18, ILLINOIS

## Blue Book available on Microfilm

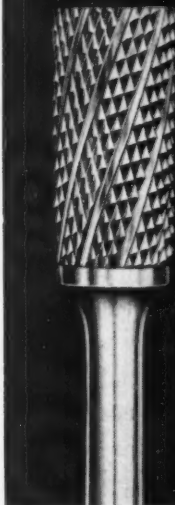
Hitchcock Publishing Company, 222 E. Willow Avenue, Wheaton, Ill., has recently entered into an agreement with University Microfilms, Ann Arbor, Mich., to make available to libraries the back issues of two of its publications—Machine and Tool Book and Wood Working Digest—in microfilm form.

According to the film producers, one of the most pressing problems which

faces libraries of all types today is that of providing sufficient space for the tremendous volume of publications. Periodicals present an especially difficult problem, due to their bulk and quantity.

Microfilm makes it possible to produce and distribute copies of periodical literature on the basis of an entire volume in a single roll of film, in editions of 30 or more. The cost is roughly equal to the cost of binding the identical

# NO MENTAL HAZARD with the **P&W KELLERFLEX** **CARBIDE**



**FORGET SLIVERS!** DI-BUR eliminates sliver condition by removing steel in small granules, kind to operators' hands.

**FORGET BREAKAGE AT BRAZE!** Special brazing application places "shock absorber" between Carbide and steel Shank.

**FORGET HIGH SPEEDS!** DI-BURS run at half the speeds usually recommended for carbide burs.

**FORGET LACK OF CONTROL!** DI-BUR stays where you want it instead of walking away from work.

**FORGET FATIGUE!** DI-BURS are so easy to control, operators work as well at end of day as at the beginning.

Order from stock direct from P&W Branch Office near you.

Birmingham\* • Boston  
Chicago • Cincinnati  
Cleveland • Dallas (The  
Stanco Co.) • Detroit  
Houston (The Stanco Co.)  
Los Angeles • New York  
Philadelphia • Pittsburgh  
Rochester • St. Louis  
San Francisco. Also from  
Factory Stock at West  
Hartford, Conn.

\*Office only.

## PRATT & WHITNEY

Division NILES, BEMENT, POND COMPANY

WEST HARTFORD 1, CONNECTICUT, U. S. A.

Dedicated to Accuracy for 91 years



magazines in the customary library bindings.

Under the University Microfilm plan, the library keeps the printed issues unbound, and circulates them in that form for from two to three years, the period of their greatest use. As the magazines begin to wear out, or are asked for less frequently, they are destroyed and the microfilm copies are substituted.

The microfilm is in the form of posi-

tive microfilm, and is furnished on metal reels, suitably labeled. For complete information, inquiries should be addressed to University Microfilms, 313 N. First St., Ann Arbor, Mich.

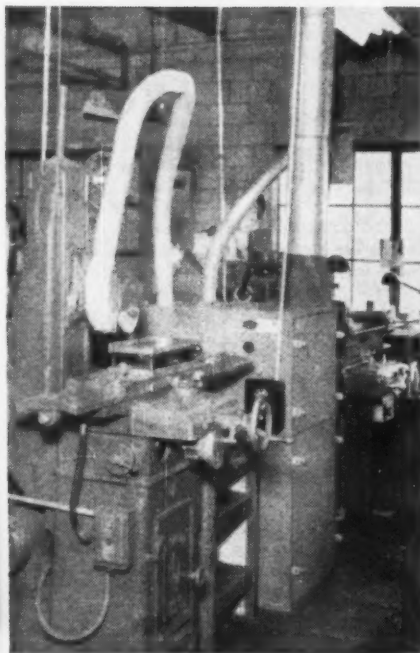
Reed-Prentice Corp, Worcester, Mass., announces the appointment of **James H. Wolcott** as sales manager of its Machinery Division, supervising sales activities in the main office at Worcester and with the company's branch sales offices and agents.

**APPROVED...**

**by customer  
by workmen  
by industrial  
commissions**

# **TORIT**

## **DUST COLLECTORS**



Here a Torit No. 84 Dust Collector is meeting all the requirements of the customer, the workers, and a state commission, in trapping and cleaning dust laden air from two surface grinders. The only special adaptation necessary was to connect the exhaust vent to a pipe leading through the roof—a special condition in this state.

Compact and self-contained Torit Dust Collectors are exceptionally easy to fit into present and future production set ups. Installation and operating costs are low and efficiency is high. Today, well over 20,000 are in use throughout American industry.

*If you have an industrial dust problem, write today for complete information and latest Torit catalog.*

# **TORIT**

**Manufacturing Co.**  
303 Walnut Street • St. Paul 2, Minn.

## MODERN TOOLS

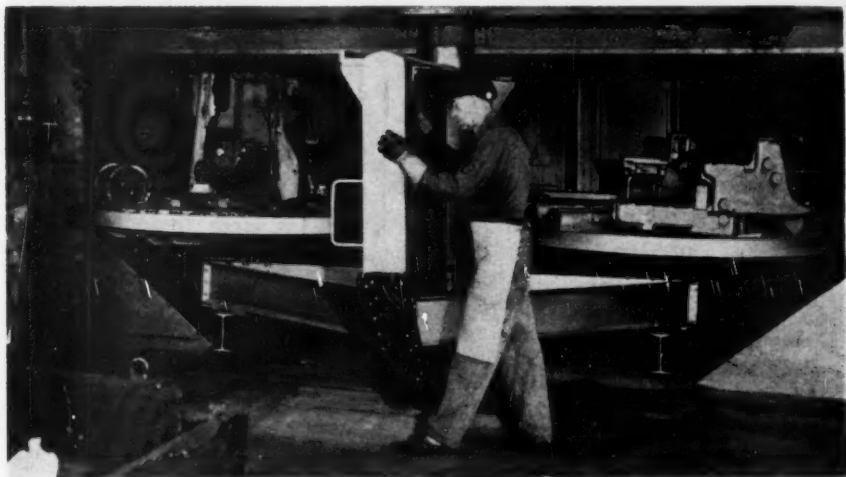
*in*  
**ACTION**

### Increased production by modernizing cleaning method

Yates-American Machine Co. manufactures woodworking machinery and heat transfer equipment. Five old-style tumbling mills were used to clean the small cast pieces and parts. An airblast room handled the larger castings. To replace and modernize cleaning procedures, two standard Pangborn airless

centrifugal-type blast cleaning machines have been installed—a large turn-table type to handle castings up to 1500 pounds (yokes, tables, bases, wheels, radiators), and a 7 foot "Rotoblast" rocker barrel which handles all the pieces suitable for tumbling (parts for lathes, planers, surfacers, saws, ra-

A "turn-style" airless centrifugal type machine . . . permits a practically continuous flow of cleaning. One load is always inside the chamber revolving under the blast stream while the other table is outside in loading and unloading position.



diators, oil coolers, and refrigeration and air conditioning equipment).

According to Foundry Superintendent Deubner, parts and pieces which previously required 2½ to 3 hours to clean in the five tumbling barrels are now blast cleaned in the airless machine in 30 minutes, or approximately 6 times as fast. Larger castings, which are cleaned on the new "turn-style" table in 10 to 12 minutes, previously required 35 to

45 minutes in the air-blast room—or three to four times as long.

This great increase in capacity to clean castings has permitted the transfer of two skilled men to other departments where their skills are needed today. It also meant that a long-planned preventive maintenance program could be activated, since cleaning time was cut sufficiently to allow time for required replacements and repairs during working hours.

---

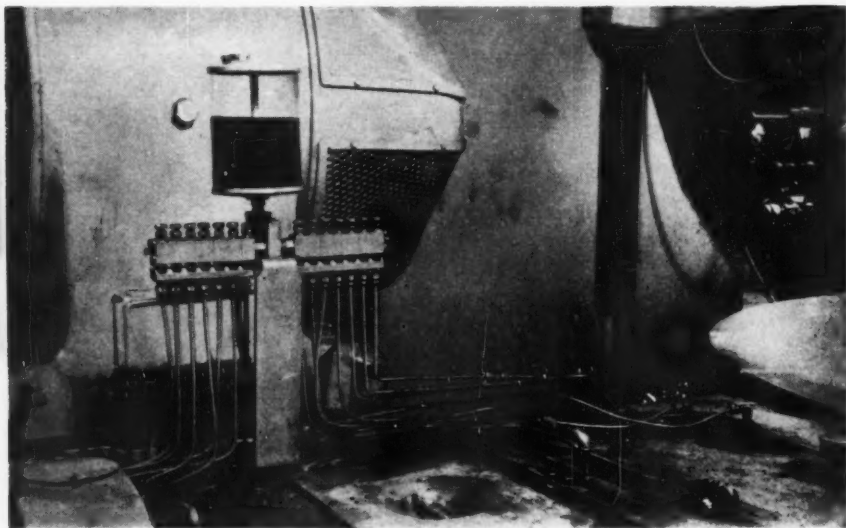
### **Automatic oilers cut lubrication cost 74%**

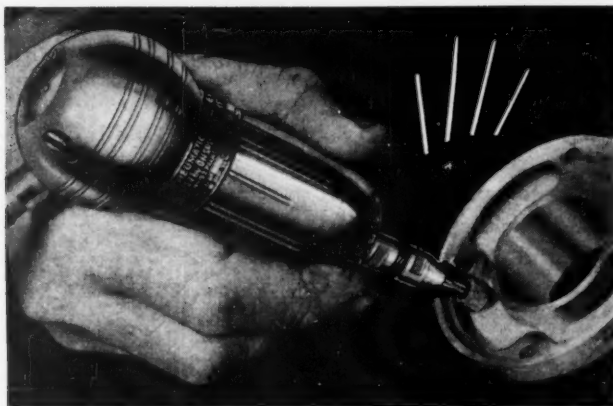
Three solenoid-operated automatic oilers replacing 30 manually operated individual oiling cups on one 100-inch boring mill at Nordberg Mfg. Co. of Milwaukee, Wis., reduced the machine's annual lubricating cost 74 percent, with a 50 percent saving in the amount of oil used, and 90 percent reduction in

operation and maintenance of oilers. Annual lubricating cost of the machine was reduced from \$281.00 to \$75.00.

Previously, each of the oiling cups at each of the 30 points on the boring mill had to be filled daily by the machine operator who had to shut down

**Three solenoid-operated automatic oilers . . .** replacing 30 manually operated individual oiling cups on one 100-inch boring mill reduced the machine's annual lubricating cost 74%.





## THIS *Whirlwind* IN YOUR HAND speeds grinding and deburring jobs!



**ONSRUD  
B-1 GRINDER  
75,000 RPM**

**ONSRUD  
D-1 GRINDER  
50,000 RPM**

**ONSRUD  
E-1 GRINDER  
38,000 RPM**

Compressed air . . . and Onsrud's famous Air Turbine Grinders . . . give you an unbeatable combination for speedier grinding in the tool and die shop or on the production line.

Can be mounted on lathe for center or finish grinding. D1-S Hole Grinder supplied for mounting on jig borer, milling machine or drill press for precision hole grinding.

Light in weight. Always cool in operation. Free from vibration, yet packed with power. Write for Bulletin 1129.

AIR TURBINE MOTORS  
ROUTERS AND SHAPERS  
CONTOUR MILLING MACHINES  
HIGH CYCLE MOTORS

### ONSRUD MACHINE WORKS, INC.

3908 Palmer Street • Chicago 47, Illinois

the machine to fill and turn on each cup individually. Over-oiling, uncontrolled flow of oil and failure to shut off oilers at night created a loss of more than 31 gallons of lubricating oil per year. Spillage of oil over machine and surrounding floor greatly endangered machine and personnel safety by creating a fire and slippery floor hazard. Another costly disadvantage of the oiling cups was that they had a tendency to lubricate excessively at the start and gradually starving bearings

during remainder of operation, causing excessive wear and tear on bearings and reducing machine efficiency and life.

Installation of the three automatic oilers reduced the number of oil reservoirs to maintain and operate from 30 to three. All 30 points on the boring mill are fed from the three centrally located and easy to see reservoirs that feed oil by gravity to 14, 8 and 8 outlets respectively. Easily adjustable outlets regulate the flow of oil as desired

# MERCOID

**AUTOMATIC CONTROLS FOR HEATING, AIR CONDITIONING,  
REFRIGERATION AND VARIOUS INDUSTRIAL APPLICATIONS**

**THE ONLY 100% MERCURY  
SWITCH EQUIPPED CONTROLS**



The distinguishing feature of Mercoid Controls is the exclusive use of Mercoid hermetically sealed mercury switches. These switches are not subject to dust, dirt or corrosion, thereby assuring better performance and longer control life. The items shown below are but a few miscellaneous items. See Catalog No. 700 for the complete line.



Pressure Controls



Temperature Controls



Float Operated Controls



Transformer-Relays



Low Voltage Thermostats



Line Voltage Thermostats



Liquid Level Control



Oil Burner Safety  
and Ignition Controls

If you have a control problem involving the automatic control of pressure, temperature, liquid level, mechanical operations, etc., it will pay you to consult Mercoid's engineering staff—always at your service.

Write for Mercoid Catalog No. 700  
It contains a lot of control information.

THE MERCOID CORPORATION • 4223 BELMONT AVE. CHICAGO 41 • ILL.

for each point to be lubricated, completely eliminating waste, spillage and the possibility of eventually burning out bearings through gradual starving. In addition to the saving already cited, not a single bearing has had to be replaced since the automatic oilers were installed.

Solenoids of the oilers are connected across the line of the driving motor so that their operation is started and stopped automatically when the motor is started or stopped. Machine can be

lubricated while running. Since the installation of the electro oilers, filling of the three reservoirs is done by a night oiling crew.

The solenoids are easy to wire and are available in all commercial voltages and frequencies, a.c. and d.c. and can be operated continuously without overheating.

Transparent reservoirs are made for use at temperatures above 160 degrees F and are large enough to hold a week's oil supply per filling, further reducing

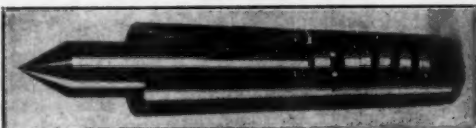
## RUGGED

"NIROL" LIVE CENTERS permit perfect support of all loads and thrusts. Reduced overhang adds rigidity and increases machine capacity. Compensating factor provided for work expansion from heat while machining.

Write for complete details.

**NIROL MFG. CO.**  
900 HIGHWAY 29  
NORTH PLAINFIELD, N. J.

- **Faster Machining**
- **No Scored Centers**
- **Remarkable Accuracy**



Patent Applied for

maintenance cost.

Made by the Oil-Rite Corporation, 3474 South 13th Street, Milwaukee 15, Wisconsin, electro oilers are engineered for any number of outlets that can be increased or decreased in the future, and with reservoirs in sizes ranging up to a gallon capacity.

### Broaching speeds production super-charger wheels, blades

For accelerated production of Turbo-Supercharger wheels and mating blades, The Lapointe Machine Tool Co. have developed a broaching procedure based on their single ram vertical broaching machine. Both jobs are handled on a 15-ton, 90" stroke machine through the use of interchangeable fixtures.

The wheel fixture embodies completely automatic indexing and hy-

draulic clamping. The blades are broached two at a time—the first blade



Time required to broach this wheel with 32 pine-tree slots, is 65 minutes.

## Air-O-chek... For Air and Liquids



Model A

Model FA

The valve with the Internal Fulcrum Lever

An invention in value means

Hundreds of thousands are in use in leading factories, machine shops and foundries. See your jobber or write direct for full details.

**AIR-WAY PUMP & EQUIPMENT CO.**  
1054 N. Kilbourn Ave. Chicago 51, Ill.

## BOSTON UNIVERSAL ANGLE PLATE

A Precision Tool  
that Holds Work  
at Any Desired  
Angle.



Horizontal motion is 360 degrees; vertical motion, 120 degrees. Fitted with vernier scale reading to 5 minutes.

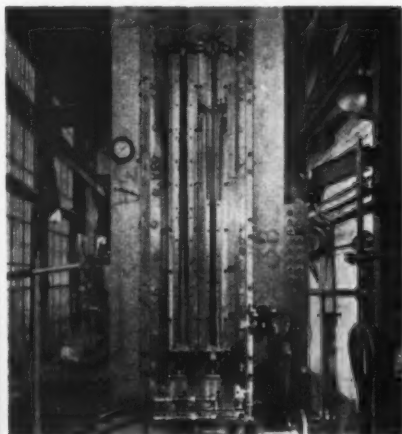
**Puts Speed and Profit into Angular Drilling, Milling, Planing, Shaping, Grinding**

With a Boston Universal Angle Plate on the job, work is quickly set up on the table and but a few seconds are required to locate it at the desired angle. Indispensable in tool rooms and extremely useful in production runs, the Boston Universal pays for itself many times over by eliminating the necessity of expensive jigs and fixtures.

**Made in several stock sizes. Write today for full information.**

**US AUTOMATIC BOX MACHINERY CO., Inc.**

**11 ARBORETUM RD.  
BOSTON 31, MASS.**



Machine which speeds production of super-charger wheels and blades is a 15-ton single ram vertical broaching machine.

being rough broached, and the second one finished broached, at the same stroke of the machine. Conventional tools are used. Fixtures for both the wheel and the blades are mounted on in-and-out tables.

The wheel is a conventional forging. The blades are broached from bar stock, Timken Alloy 16-25-6.

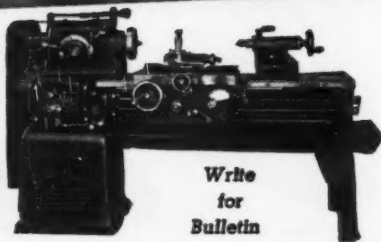
Based on 80% efficiency, the time required for broaching the complete wheel, with 32 pine-tree slots, is 65 minutes. The blades are broached at a speed of 60 finished blades per hour. Very close tolerances are maintained—within .0005" to .0007". However, closer accuracy than this can be obtained, it is claimed, even with the production speed indicated above.

The Cleveland Grinding Machine Company, formerly located at 6514 St. Clair Ave., Cleveland 3, Ohio, has moved to greatly enlarged quarters at 1643 Eddy Road, Cleveland 12, Ohio.

## CARROLL and JAMIESON

- 16" Lathe
- 12 Speed Geared Head
- Motor Drive Timken Mounted Spindle
- Modern Design
- Liberal Dimensions

**Carroll & Jamieson Machine Tool Co.**  
BATAVIA, OHIO, U.S.A.



**Write  
for  
Bulletin**

# ENGRAVING • PROFILING VERTICAL MILLING

WITH THE *Engravograph*



Write for literature describing:

1. Bench type Engravograph (illustrated) Catalog H-28
2. Portable Engravograph — Catalog IM-28

**NEW HERMES, Inc.** 13-19 University Place  
New York 3, N. Y.  
CANADA: 359 St. James St., Montreal

World's Largest Manufacturer of Portable Engraving Machines

## New pipe flange facing lathe increases output

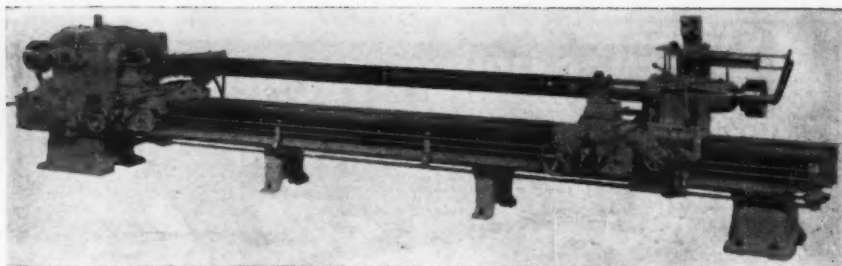
This is a special 25"x240" model X pipe flange facing lathe built by Lodge & Shipley for the American Cast Iron Pipe Co. The production data is based on machining 6" pipe. At the present time 8, 10, and 12-inch pipes are being run on the machine.

The floor-to-floor time for the 6" pipe is approximately 4 minutes per pipe. Both flanges on 87 pipes per day are

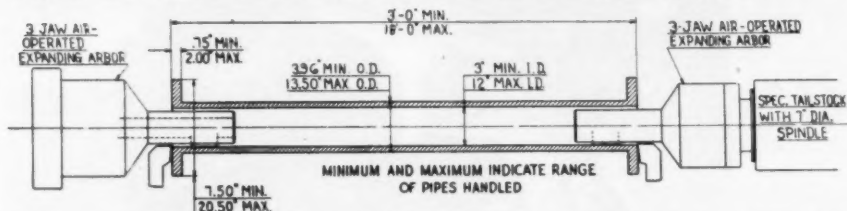
machined, compared to a former production of only 17 pipes per day.

The material of the pipe is cast iron. Carbides are used at a machine speed of 65 r.p.m. with a feed of .058" per revolution. The operation consists of facing pipe flanges.

Four-way tool blocks are provided for each carriage in order that an additional facing tool of the opposite hand may be available for facing the inside of the flanges whenever necessary. Another station may be used for



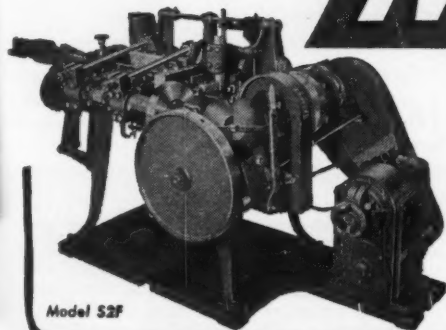
View of the new pipe flange facing lathe and sketch of a typical operation.



a turning tool for turning the outside diameter of the flanges, if required. The half nut levers on each apron are kept engaged when using the special dial for

moving both carriages simultaneously. If turning is required they are disengaged in order that the longitudinal feed may be engaged.

## TRULY—THERE'S *NOTHING LIKE A* **NILSON**



Model S2F

**For Rapid,  
Accurate, Automatic Production**

### • Combination Press and 4-Slide Forming Machine

Extra rigid construction; tooling costs are generally lower; forming tools are interchangeable and easy to adjust. Send for catalog.

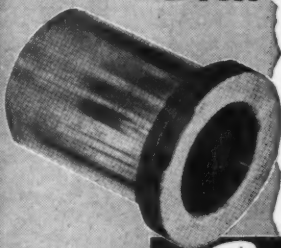
**A. H. NILSON MACHINE CO.**  
**BRIDGEPORT 5, CONN.**

Automatic Wire and Metal Forming Machines • Staple Forming Machines • Chain Making Machinery • Foot and Power Presses • Wire Reels • Wire Straighteners.

**SPECIALISTS IN WIRE FORMING EQUIPMENT FOR OVER 50 YEARS**



## You're a Production Winner with **Economy** Drill-Jig Bushings and Gages



Yes, they're in stock, ready to go out to you — all A. S. A. standard types and sizes. You can also get fast service on new gages or gages salvaged by hard chromium plating . . . precision-finished, durable. Write for bulletin and price list.

# Economy

**TOOL & MACHINE CO.**

1829 SOUTH 68th STREET • MILWAUKEE 14, WISCONSIN

**NOTCHING TUBING OR  
PIPE ENDS EASILY WITH**

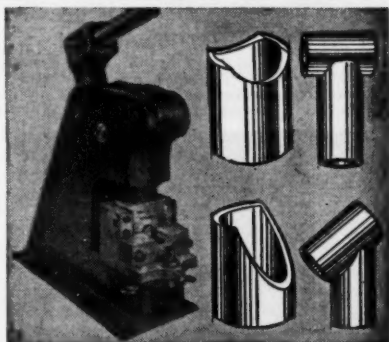
## ARC-FIT \*

Reg. U.S. Pat. Off.

**IN POWER PRESS  
OR HAND PRESS**

Arc-Fit is a notching unit for preparing pipe or tubing ends in making welded or braced tubular joints. Arc-Fit will prepare the ends of a pipe or tube in less than 8 seconds. Arc-Fit is a production tool that will cut your production costs. It is applicable in any industry where pipe or tubular construction is used.

- Arc-Fit can be utilized in any power press.
- Arc-Fit can be furnished for any size tubing or pipe.
- A hand press can be supplied with Arc-Fit units for shearing pipe or tubing sizes 2 inches or under.



- For sizes over 2", angular cuts other than 90°, and slotting operations. Quotation furnished on request.
  - Arc-Fit does not deform pipe or tube. No grinding or finishing operation is needed.
  - Engineers can now design for tubular construction and cut costs.
- Write today for circular and prices.

Manufactured Exclusively by

## VOGEL TOOL & DIE CORPORATION

1825 N. 32nd Street

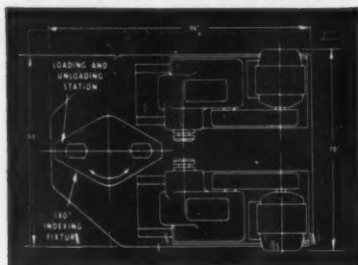
Melrose Park, Illinois

# A New Concept-DUPLEX PRODUCTION Milling Machines as Developed by METCH & MERRYWEATHER



Great power and rigidity are transmitted at the tool point. Right-hand and left-hand milling heads rapid traverse approach, feed, and rapid return. The rotary index table carries two sets of workholding fixtures and is positively locked at the milling station. Here is the essence of rigidity.

**M. & M. Duplex**  
Production milling  
machines fit easily  
into conveyORIZED  
production lines.  
Parts are loaded  
and removed at one  
station. Production:  
268 tractor side bars  
per hour at 100%.



General design of Metch & Merryweather Duplex Production Milling Machine.

With this Metch & Merryweather single-purpose production milling machine the two heads move, not the operator. There is no milling table to move. Let us tell you why greater rigidity and power (30 h. p.) will jump your production. Fixtures can be changed within certain limitations to suit your requirements. Your part drawings will receive our prompt attention.

Manufactured by

**THE METCH & MERRYWEATHER MACHINERY COMPANY**  
715 PENTON BUILDING • CLEVELAND 13, OHIO  
Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT



# Shop HINTS



## A collection of shop hints

by Frederico Strasser  
Santiago de Chile

### Long cuts with machine-tools

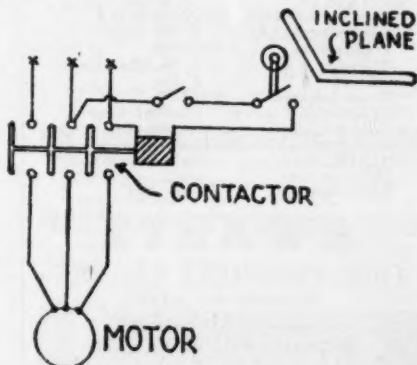
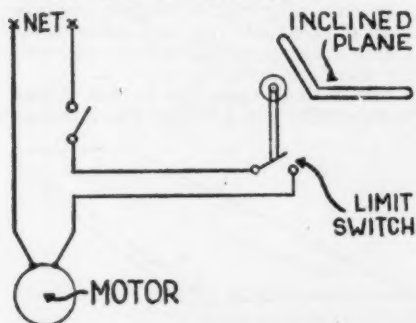
When a machinist must take care of several machine-tools simultaneously, and in the meantime wants to occupy himself with other jobs, he must employ some electrical device of automatic stop.

In case of a small machine, driven directly by a single phase motor, such a device can consist simply in an auxiliary single-pole or double-pole limit switch, of the type employed in elevator-installations. This switch, connected in the motor-circuit, see fig. 1, is actuated by an inclined plane, conveniently located on the movable part

of the machine (lathe-carriage, shaper-table, milling machine-table, etc.). Of course, the inclined plane must be regulable, in order to give the possibility to arrange the instant of stop exactly according to the needs.

In case of greater single-phase motors, or three-phase motors, one must utilize a contactor (magnetic, remote control switch). In the commando-circuit of the contactor is connected opportunely the same auxiliary limit switch of the precedent case, actuated in the same way. Figure 2 shows clearly the complete electrical wiring diagram for such case.

Below: figure 1; Right: figure 2



# DESIGNERS BUILDERS

**All Types of Holding  
Fixtures for Machine  
Shop Production**



**FIVE  
LOCK  
SIZES**

**75 Various Model and Fixture Sizes**

**CATALOG 941  
AVAILABLE**



## REPRESENTATIVES

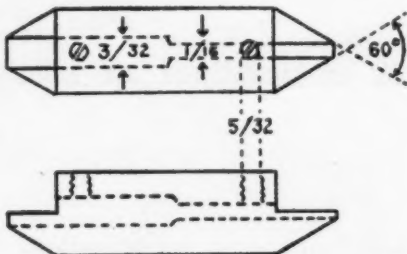
<b>SYRACUSE</b> Arthur Irvine	<b>LOS ANGELES</b> Technical
<b>CLEVELAND</b> Production	Broaching Co.
<b>MILWAUKEE</b> Tool Co.	<b>NEW ORLEANS</b> Engineering
<b>HOUSTON-DALLAS</b> Geo. M. Wolff Co.	Sales Co.
<b>CHICAGO</b> Ernie Johnson	<b>CINCINNATI</b> R. W. Pratt
<b>PITTSBURGH</b> Tool Engineer	<b>BOSTON</b> A. R. Shevlin
<b>PHILADELPHIA</b> Morgan Tool	& Co.
Equipment Co.	<b>TOLEDO</b> Peerless Tool
	Service Co.
	<b>CANADA</b> Firth Brown Tools,
	Ltd.
	Galt, Ont.

**SWARTZ**  
**TOOL PRODUCTS CO., INC.**  
Telephone WE 3-1522  
**13330 Foley Ave.**  
**Detroit 27, Michigan**

## Combination center-drill, home-made

Take a drill-rod of  $\frac{3}{8}$ " diameter, cut a piece of proper length ( $2\frac{1}{2}$ " - 3") and perform the following simple operations in order to obtain a perfect center-drill for turning jobs between centers (see attached drawings):

a) drill longitudinally (centrally) until the middle, with  $\frac{1}{16}$ " and  $\frac{3}{32}$ " drills;



b) turn conically ( $60^\circ$  included angle) the two points;

c) flatten with the shaper (or perhaps only with the file) the half of the conical points;

d) drill and tap the two holes for the holding screws;

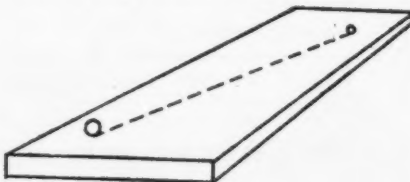
e) Harden, and afterwards grind, (if necessary).

When putting two standard, short drills of  $\frac{1}{16}$ " resp.  $\frac{3}{32}$ " into the corresponding holes and two short holding screws, the center-drill is ready for use.

## Emergency level

In case of perfectly smooth surfaces a good steel-ball (e.g. one taken from a ball-bearing) can substitute very well for standard level.

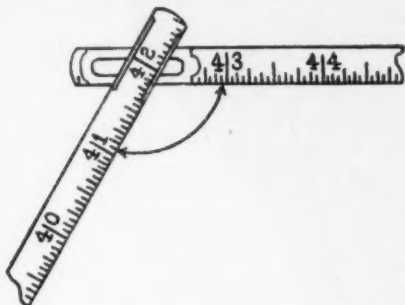
Put the ball upon the surface whose horizontality you will test. The direction



which the ball takes, because of the gravity, indicates the inclination of the surface.

### Emergency universal bevel

In case you do not have a standard universal bevel, at hand, with joints provided with screws and wing-nuts, you can employ a standard joint wooden rule (see attached drawing). The artic-



ulations of the joints have sufficient pressure to keep their position in transporting or laying out an angle.

Of course, this device has no pretence of precision; it serves only for rough jobs.



"Don't worry, sir, this demonstration is free and places you under no obligation."

**PROTECTRON**  
*paid for itself*  
in two months by  
**INCREASING OUTPUT**  
**12½%**



JAMES G. SCHNELL, President of The Brinnell Company—nationally known authorities on "Preventive Maintenance" and production efficiency.

If you could increase the output of each machine in your plant an hour a day without increasing overhead, what would it mean to you in dollars and cents?

Protectron guarantees that extra production hour by monitoring automatic machines through coffee and smoke "breaks" even lunch periods and while operators procure and ready new stock. You get nine hours worth of production from every eight hour shift.

That's at least 12½% more output from every Protectron equipped machine, and some plants report increases up to 22%.

#### REDUCES tool and die BREAKAGE up to 86%

Protectron senses any increase in mechanical overload and automatically stops machines before trouble occurs.

#### PERMITS 1 MAN to operate 4 MACHINES

Protectron's vigilant, automatic protection enables one man to operate four machines... thus releasing three men for other work.



*The Brinnell Company*  
SIMSBURY, CONN.

**a *handful* of help  
for your close-quarter work**



**BUCKEYE**

PATENTED

**CONE-JAW  
CHUCKS**

CAPACITY TO  $\frac{1}{4}$ "

A small chuck—just  $\frac{13}{16}$ " O.D.—designed to do a big job, especially when tool space is limited. Low in first cost, lower still in maintenance—jaws are easily replaced in

one minute without using any tools. Rolling action of cone jaws as chuck is tightened presents a new face to tool shank each time, reducing jaw wear, and pulls shank firmly into recess in chuck, insuring true alignment. For use with all Buckeye 30°, 90°, 360° adjustable, angle head tools—easily adapted to other makes. Thousands of Buckeye Cone-Jaw Chucks are saving time and money in hundreds of plants today—how about yours?

**Buckeye Tools**  
CORPORATION

DIVISION 14 • DAYTON 1, OHIO

**PORTABLE AIR AND ELECTRIC TOOLS FOR INDUSTRY**

NEWS OF THE INDUSTRY • NEWS OF THE INDUSTRY • NE

## Miller Motor Company opens new cylinder plant

In order to meet the greatly increased demand for its products, Miller Motor Company, 4027 N. Kedzie Ave., Chicago, manufacturer of air and hydraulic cylinders, has built a new plant comprising an area of about 50,000 sq. ft. at Melrose Park, Ill., a suburb within the Chicago metropolitan area.

The new plant represents the latest up-to-date plant design and layout and is equipped with the most modern machines and production facilities. Unusual features of the plant's interior design include the use of 'color dynamics'; and

the complete inter-visibility between all departments of office and factory, glass partitions being used throughout to divide the various departments.

The new plant has its own car parking lot and, in general, its location permits convenient access by automobile, bus, truck or taxi to main rail and air terminals.

Production began at the new plant on about July 15, 1951 and a welcoming "open house"—with refreshments, plant tours, etc. for visitors—took place on September 15th.



## U. S. Civil Service engineering examinations announced

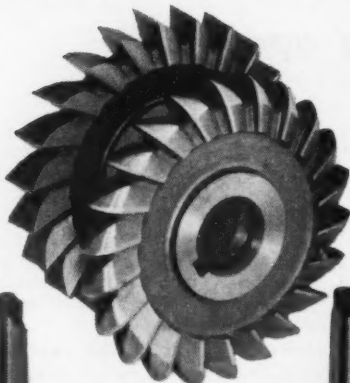
The United Civil Service Commission has announced a new examination for filling positions in all branches of engineering. The salaries range from \$3,100

to \$10,000 a year. The positions are located in Washington, D. C., and vicinity. Sanitary engineer positions in the U. S. Public Health Service located throughout the country will also be filled.

Applicants will not be required to



# RUTLAND



SAVE TIME - SAVE MONEY  
SAVE TOOLS  
For rapid changeover of Tool  
setups

## SPECIAL TOOLS FROM STANDARD TOOLS

All types of special reamers, cutters, end mills and drills can be made from standard catalog tools. We can make these specials to your blue prints quickly and economically from our large stock of standard cutting tools.

Mail your specifications or blueprints today for immediate price and delivery

### Rutland TOOL SERVICE

1617 E. McNichols • DETROIT 3, MICH.

TW inbrook 3-6240

take a written test. To qualify for the \$3,100 jobs, they must have completed a professional engineering course leading to a bachelor's degree, or they must have had 4 years of technical engineering experience. Students who expect to complete the required courses within 6 months may apply. For the higher grades, additional professional experience is required. Graduate study in engineering may be substituted for part or all (depending on the grade for which application is made) of the professional experience.

Persons who have received eligible ratings since January 1, 1951 in any Engineer examination announced by the Commission's central office need not apply for this new examination as their names will be combined with those on the new registers.

Full information and application forms may be secured at most first- and second-class post offices, from Civil Service regional offices, or direct from the United States Civil Service Commission, Washington 25, D. C. Applications will be accepted in the Commission's central office in Washington, D. C., until further notice.

### C.M.A. head urges loyalty check for natives

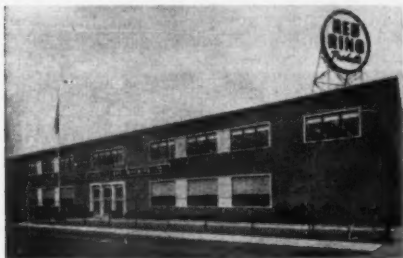
Military security on U. S. defense projects in foreign countries is a joke, it was charged recently by James H. Dillon, president of the Construction Men's Association, 82 Beaver St., New York 5, N. Y. The Association is a mutual welfare organization of 10,000 craftsmen and technicians who work on construction projects in foreign countries for American firms. More than 180,000 men and women, said Dillon, are currently working on 100 sites—mostly defense projects—around the world.

"It is a farce," declared Dillon, "for the armed forces to screen every American worker through a rigid loyalty check before they send him abroad, and then to hire thousands of native workmen at the job site without any screening whatsoever. Every American workman on jobs in Morocco, Casablanca, Tripoli, Greece and the Philippines, to name only a few, knows that many of the locally hired help are Communists."

"I insist, on the basis of first hand experience covering twenty-five years as superintendent and personnel manager of such jobs in many lands, that it is possible to give locally hired help the same screening that American workers must undergo before being sent abroad."

#### National Broach completes new administration building

National Broach & Machine Company, manufacturers of gear finishing and inspection machines, broaches, broaching fixtures and special production machines has just moved into its new administration building at Shoemaker and St. Jean Avenues, Detroit 13, Mich.



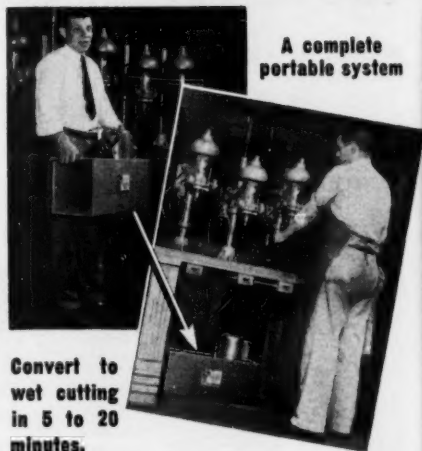
The new structure, recently completed, provides an additional 24,000 square feet of floor space for offices and engineering department. The space formerly used for offices and engineering is now being used for manufacturing.

#### Chicago Rawhide official dies

Herman M. Koelliker, 59, vice president of Chicago Rawhide Manufacturing Co., died of heart attack on August 21, 1951. Mr. Koelliker was born in Cleveland, Ohio and was a graduate of Case Institute of Technology in the class of 1914. Prior to coming to Chicago Rawhide, he was vice president and general manager of Ohio Rubber Co., Willoughby, Ohio, and vice president and a director of Baldwin Rubber Co., at Pontiac, Mich. His earlier experience included work with Grasselli Chemical Co., U. S. Rubber Co., Buckeye Rubber Co., and Tucker Rubber Co.

Mr. Koelliker joined the staff of Chi-

## Get more production from your machines with GRAYMILLS Pumps and Coolant Systems



A complete portable system

Convert to wet cutting in 5 to 20 minutes.

Graymills Coolant systems and pumps increase cutting speeds, improve work quality . . . too life.

Most industrial distributors stock standard units.



Sturdy high pressure gear models . . . smooth high volume centrifugal types in 1/25 to 70 g.p.m., with tank capacities from 5 to 38 gals. Also immersion type centrifugal pump and motor units.

Write for new catalog to

**GRAYMILLS CORPORATION**

2007 RIDGE AVE EVANSTON, ILL

cago Rawhide Mfg. Co. in 1936 for the purpose of pioneering and developing the use of molded synthetic rubber products. Under his management the Sirvene Division of the company grew from a small technical staff in 1936 to a technical and manufacturing division employing more than 1000 people. He became a vice president of Chicago Rawhide Manufacturing Company in 1942. Kcelliker was a director of the Case Alumni Association and president of the Chicago Case Club. He was interested in and a contributor to the work of Y.M.C.A., and other organizations.

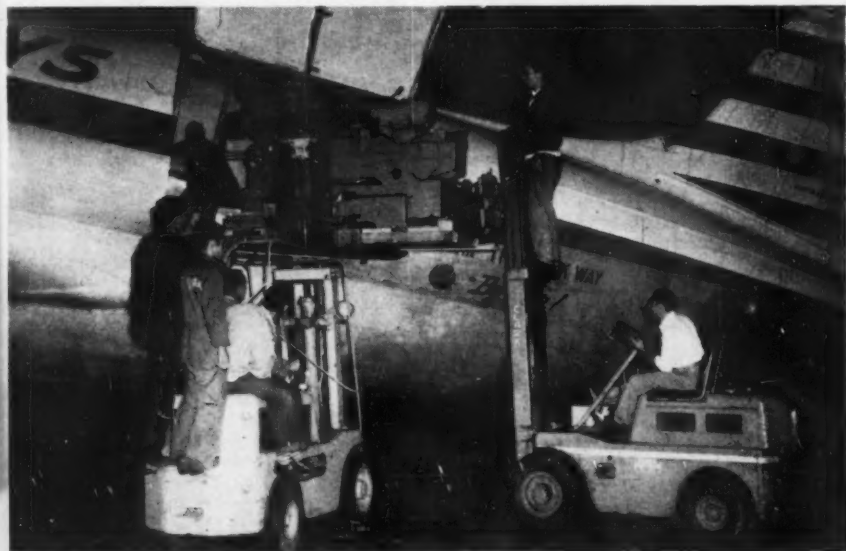
#### **Hanchett expands plant facilities**

Hanchett Manufacturing Co., Big Rapids, Mich., has expanded its plant production through the addition of a

50'x450' assembly space equipped with modern machinery and production facilities. Latest type shears, pantographs and power presses have been purchased for a new steel fabricating division, already in operation. The added area and equipment will be used for the increased production of knife grinders.

The entire plant at Big Rapids covers seven acres or approximately 222,000 sq. ft., devoted exclusively to the manufacture of saw sharpening and knife grinding machines and accessories.

According to Kent S. Hanchett, company president, Hanchett has also expanded production facilities in its Portland, Oregon plant with the installation of more than \$50,000 in new equipment. As in Big Rapids, a special group of field engineers available at the Portland plant to give the west coast area top service and consultation.



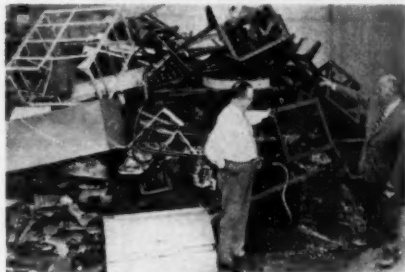
The urgent need for machine tool delivery . . . is emphasized by the above picture. Reid Brothers Company, Inc., Beverly, Mass., recently received an order for a production lathe from a Cleveland firm, to be shipped with all possible speed. The illustration shows the machine tool beginning its air journey. This lathe weighs two and one-half tons, and is said to be the heaviest single unit ever to be shipped from Logan Airport. Airport workers had to stand on the rear of the two fork trucks in order to balance the weight of the lathe. The lathe was installed at the customer's plant on the following day, where it is being used on one of the operations in manufacturing 105 millimeter shells.

### **Lyon Metal Products concludes successful scrap drive**

In an effort to comply with the steel industry's urgent request for more scrap metal, Lyon Metal Products, Inc., Aurora, Ill., recently completed an employee scrap drive at their Aurora plant which was so successful that the firm intends to repeat the drive at their York, Pa., plant. The recent drive, called "Let's Get In the Scrap" took place the week of Aug. 27-31. Plant employees were asked to cooperate in searching through their homes to collect discarded scrap steel and iron. The firm arranged with a local scrap metal firm to provide workers and trucks to pick up and haul away all scrap materials from the homes of employees who were unable to carry the scrap to the plant themselves. A remuneration was paid for all scrap steel and iron turned over to the scrap dealer by Lyon Metal Products employees.

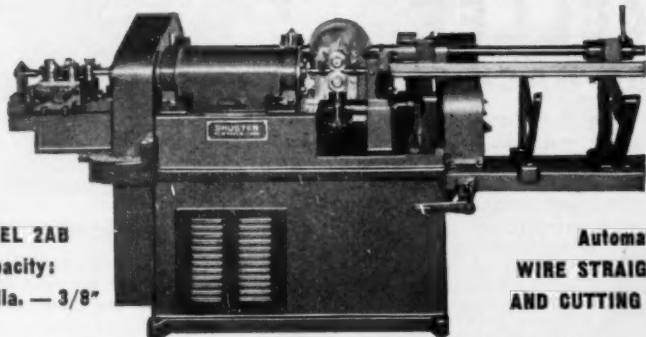
The scrap drive was successful beyond the hopes of the Lyon Metal

Products firm; several thousand pounds of desperately needed scrap metal were turned up in cellars, attics and garages of employees' homes. With cooperating publicity from local newspapers and radio stations, many citizens of Aurora telephoned the plant asking how they might add their scrap to the total. The



above picture shows one of Lyon's supervisors talking with the scrap dealer about some of the scrap turned up in the Lyon plant.

## **This New, Economical "SHUSTER" Cuts Costs AND Accurate Lengths!**



**MODEL 2AB**  
**Capacity:**  
**3/16" dia. — 3/8"**

**Automatic**  
**WIRE STRAIGHTENING**  
**AND CUTTING MACHINE**

**Shuster Wire Straighteners are available  
for wire .025" to 11/16" diameter**

**Mfd. by METTLER MACHINE TOOL, INC.**  
**19 Congress Ave. New Haven, Conn.**

## New plant of Morton Machine Works

Morton Machine Works has opened a new plant at 2421 Wolcott St., Ferndale, Mich., suburb of Detroit. The plant is completely modern, with up-to-the-minute equipment, plus an efficient production line.

When the firm was formed, it was a business based on the principle of Quality and Service. The steady application of this principle has meant a steady increase in sales and a steady growth of the organization. In September, the company completed its third expansion.

Morton Machine Works began in a small Ferndale building with a floor space of only 456 square feet. There, the Mortons manufactured fixture clamps and components. It was a small beginning but the Mortons made it pay by applying the principle they knew would work. Rather than cut corners by accepting inferior materials, they insisted on the quality that would as-

sure customers more for their money. They cut cost through efficient management and by devising time saving and



money saving methods of production that meant better products at lower cost.

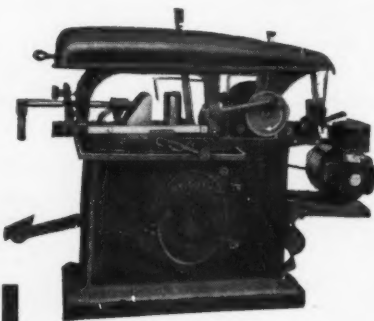
Clayton P. Fisher, Jr., has been appointed manager of materials and purchasing for the General Electric Company's major appliance division, at Bridgeport, Conn., it has been announced by Clarence H. Linder, general manager of the division. He succeeds Lee D. Nutter, who has been transferred to New York City as manager of major appliance sales in the New York District.

## Handle MORE cutting jobs at LOWER COST . . . with **KELLER** POWER HACK SAWS

Cuts everything from heavy bars to thin wall tubing fast with KELLER Saws. Simple to operate . . . designed for long blade life . . . sturdy construction assures long operation with maximum maintenance. A low priced model for every requirement.



Write Today For This New KELLER Hack Saw Catalog.



### 8 MODELS

Capacities to 63/4" x 63/4". Bench and floor types. Prices from \$97.50 to \$497.50—FOB Eau Claire, Wisconsin.

## Sales Service Machine Tool Co.

PRESS  
BITE  
PRESSES

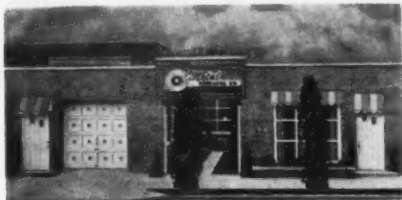
SHAPE  
BITE  
SHAPERS

KELLER  
POWER  
HACK SAWS

2357 UNIVERSITY AVENUE  
ST. PAUL 4, MINNESOTA

### Metal Removal Company moves

A new modern 15,000 sq. ft. building located at 1546 N. Orleans St. now houses the general offices and research laboratories of the Metal Removal Company, Chicago. The building incorporates many innovations for research on abrasive materials and for efficient handling of orders stocks and equipment.



Located near Chicago's Loop district, on the near north side, customers will find easy access to the new offices. A large display room houses display stocks of Pres-On abrasive discs & holders, Porcelpoint mounted wheels, carbide & hi-speed rotary files, carbide end mills and the company's complete line of die and mold finishing specialties.

The new plant will augment the manufacturing facilities and processes of the Metal Removal Co. and production will now include segments and abrasive wheels in resinoid, vitrified and rubber bonds. Friends and customers are invited to stop in and visit whenever they are in town.

### Norgren moves to new plant

The date for moving the C. A. Norgren Co., Denver, from its present location at 222 Santa Fe Drive to its new, modern plant in Englewood has been set for the two weeks starting November 17th, according to Carl A. Norgren, president of the firm.

Production operations will commence at the new plant on Monday, December 3rd.

The Englewood plant is more than two and a half times the size of the old plant and will include many new units of production and materials handling equipment. The attractive new red sandstone structure will overlook the Santa Fe Trail and will present a panorama of the Rocky Mountain range.

bend pipe by hand or  
power with

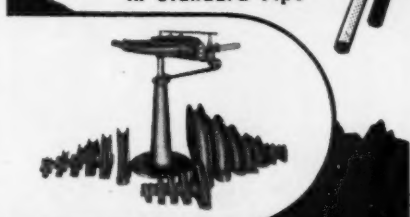
**American**

Cold Pipe, Conduit and  
Heavy Wall Tube

**BENDING MACHINES**

Fast...Simple...Dependable

**RADIANT HEAT BENDS**  
in Standard Pipe



Hand-Powered "American" A-30

Fast... Accurate... Average  
bend takes only 10 seconds! Up  
to 180° bends... all sizes from  
1/2" to 2". Usual radiant heat  
bends for 1/4" at 6" and 9" radii  
can be supplied. Only 7 parts.  
Standard radius 5 times pipe size.  
Occupies 18" x 18" floor space.



Motor-Powered "American" 2PB

Capacity 1/2" to 2" standard pipe  
... Standard radius 5 times pipe  
diameter up to 180°... Maximum  
radius 13". Complete with rolls  
for each size pipe. Standard motor  
equipment 2 h.p.

Special radii  
supplied on  
request

**American**  
**PIPE BENDING MACHINE**  
Company

Factory and Main Offices:  
9 Furnace St., Poultney, Vt.

# STOP OILY FLOOR MISHAPS



with Tamms

## DRY-IT



Avoid costly accidents caused by slipping on oily or greasy floors! Reduce fire hazards! Replace sawdust or wood shavings with Fuller's Earth. Every shop needs this low-priced safety aid. Fuller's Earth ABSORBS oil and grease—and it's noninflammable. Write for PRICES and FREE SAMPLE to test.

**DRY-IT (Natural Fuller's Earth)  
10-44 Mesh**

**DRY-IT (Calcined) 10-44 Mesh**

*Write Dept. 3*

**TAMMS INDUSTRIES, INC.**

228 N. LaSalle St., Chicago 1, Ill.

John C. Ewer has been appointed managing director of Norton Grinding Wheel Company, Ltd., Welwyn Garden City, Herts, England. Announcement was made by Herbert A. Stanton, vice president and general manager of Norton Company's foreign division.



John C. Ewer



L. K. Stringham

L. K. Stringham has been appointed chief engineer for The Lincoln Electric Company, Cleveland 17, Ohio; G. G. Landis will continue as engineering vice president according to a recent announcement by C. G. Harbruck, assistant to the secretary.

### G-M will build Bullard lathes

The Fisher Body Division of General Motors will begin building Bullard Cut Master vertical turret lathes under subcontract to The Bullard Company, Bridgeport 2, Conn., it was recently made known. The announcement was made concurrently in Bridgeport and Detroit by E. C. Bullard, president of the machine tool concern, and J. J. Cronin, vice president of General Motors and general manager of its automobile Body-Building Division.

Fisher Body's Pittsburgh plant will serve as the assembly point for the Bullard production. Fabrication will take place in Fisher Body tool room facilities in Pittsburgh, Cleveland, Hamilton, Flint Plant No. 1, and Detroit Plants 21, 23 and Fleetwood. Plans call for the maximum production of 50 units a month.

This subcontract applies only to the 42" size Cut Master Vertical Turret Lathe with standard bed, intermediate speed range, turret head, side head, 4-jaw hand operated chuck, cutting lubricant system, electrical equipment as required for 220-440 volts operation.

### **Norton and Behr-Manning establish export firm**

The formation of a new company to be known as Norton Behr-Manning Overseas, Inc., has been announced by Norton Company, Worcester 6, Mass., and Behr-Manning Corporation, Troy, N.Y. The new firm will handle all of the export business and direct the subsidiary plant operations of these two corporations throughout the world. Headquarters will be in Worcester, with branch offices located in New Rochelle, N.Y. and New York City.

Norton Behr-Manning Overseas, Inc., will handle the exportation of all Behr-Manning and Norton products and will supervise and direct the operations of subsidiary manufacturing plants of both Norton and Behr-Manning companies located in Australia, Canada, England, France, Germany, Italy and South Africa.

Officers of the company are: president Herbert A. Stanton; executive vice president and general manager, A. Donald Kelso; vice presidents, Philip N. Cooke, Paul A. Krumdieck, Frank M. Ryan, Jules A. Schaetzel and Henry J. Sheehan; treasurer, William J. Magee; assistant treasurer, Joseph P. Morano; and secretary, Curtis M. Clark.

### **ASTE 1952 industrial exposition**

The ASTE Industrial Exposition to be held in Chicago, March 17-21, inclusive, 1952, will be the largest and most comprehensive Exposition ever staged by the American Society of Tool Engineers, according to advance reports.

Floor plans and details on the show just released from ASTE headquarters at 10,700 Puritan Ave., Detroit 21, Mich., reveal that the five halls comprising the exhibit area at the International Amphitheatre represent a 30% increase in floor space over the largest biennial exposition previously sponsored by the technical society.

First mailing of floor plans of exhibit space, etc., went to those several hundred companies who had requested priority on choice of space following the Industrial Exposition held in 1950 in Philadelphia.



# **DOWEL PINS**

**Immediate  
Delivery!**

Standard Size Dowel Pins from  $\frac{1}{8}$ " to 1" diameter and from  $\frac{3}{8}$ " to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 over-size will be furnished.

Dealer's  
Inquiries  
Invited.

# **SCHULTZ & ANDERSON COMPANY**

**111 EDISON PLACE  
NEWARK 5, N.J.**

# AVAILABLE from STOCK

## Chicago "Die Cast" PULLEYS

Diameters range from 1" to 14" for "A", "B" or "C" section V-belts. All pulleys have standard bores and keyways and are furnished with slotted screws.



A complete line of Die Cast Power Transmission Parts are ready for your immediate delivery.

No expensive dies to build . . . no large inventories to carry.

## Chicago "Die Cast" SHAFT COLLARS

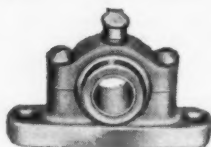
These shaft collars are available from stock in bores from 1/2" to 1 1/2". All sizes are furnished with slotted set screws ready for immediate assembly.



You save Time and Money when you adapt Chicago Die Castings to your production equipment.

## Chicago "Self-Aligning" PILLOW BLOCKS

Designed for moderate speeds and loads, CHICAGO Pillow Blocks are available in bore sizes from 1/2" to 1 1/2". A complete line of Babbitt, Bronze and Ball Bearing Pillow Blocks are ready to meet varied service and design requirements.



For complete information on the full line of Chicago Die Cast Stock Parts write for catalog No. 53HB.

**Chicago**  
**DIE CASTING MFG. CO.**  
2515-17 West Monroe Street  
CHICAGO 12, ILLINOIS



## Power tool manufacturers unite

Representatives of manufacturers of Power Tools met in Washington August 21, 1951 and formed the Power Tool Manufacturers Association. The executive office of the new group is located at 732 Dupont Circle Bldg., Washington 4, D.C. The ten charter members of this association include: Atlas Press Co., Boice-Crane Co., Central Specialty Div., King-Seeley Corp., Double A Products Co., Delta Power Tool Div. of Rockwell

Manufacturing Co., Duro Metal Products Co., Logan Engineering Co., Magna Engineering Corp., Famco Machine Co., and Walker-Turner Div., Kearney & Trecker Corp.

Elected as president of the new association was: Myron H. Buehrer, vice president & general manager of the Boice-Crane Co., Toledo, Ohio; chosen as vice-president was Herbert Upton, president of Double A Products, Manchester, Mich.

**HOME  
APPLIANCES**

*or*

**MUNITIONS**



## **RUTHMAN GUSHER COOLANT PUMPS DO THE JOB!**

In thousands of plants all over the free world Ruthman Gusher Coolant Pumps are busy speeding the production of metal parts for everything from home appliances to munitions.

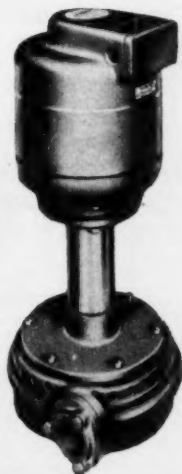
Everyone at Ruthman—engineers, machinists, executives—is proud of the fact that these Gusher Pumps can be depended on to do their job well, for Gusher Pumps are designed and built to take that extra strain extra effort, that increased civilian and military demands require:

For a pump that can be depended on, that requires minimum maintenance care and does its job efficiently and economically, you can't beat Ruthman Gusher Coolant Pumps. Write us today. We'll be glad to supply additional information.

### **THE RUTHMAN MACHINERY CO.**

1816 READING ROAD

CINCINNATI, OHIO



A second meeting of the Association was held on September 27, 1951 at the Wardman Park Hotel, Washington, D.C., at which time a constitution for the Association was adopted and a program of cooperation with N.P.A. and O.P.S. was discussed. The Association had recommended to N.P.A. the appointment of an Industry Advisory Committee so that problems facing this defense supporting industry could quickly be solved

Such a committee was appointed by N.P.A. and the first meeting was held on September 28, 1951, to review the problems facing the Industry and offer suggestions in an effort to find some solutions.

Two additions to the original ten members—The Shopmaster, Inc. of Minneapolis and The Emerson Electric Manufacturing Co. of St. Louis—have advised the Association of their decision to join.

# SHELDON

CHICAGO

## *A better Lathe from any angle*

Judge it from any angle: for accuracy, stamina, rigidity or capacity (for size). Check its component parts—its spindle, spindle bearings, lead screw, apron, carriage, bed, gearing, or the power delivered by its drive—you will find the SHELDON Lathe a quality tool both in appearance and "under the hood".



Write for  
Catalog

SHELDON MACHINE CO., Inc., 4242 North Knox Ave., Chicago 41, Ill.

# What's New

IN

METALWORKING

## Cosa Corporation introduces new European inspection devices

The Cosa Corporation, 405 Lexington Ave., New York 17, N.Y., is introducing to the United States several new European precision inspection and measuring devices, three of which are described below and on the following page. These include the Sigma Multi-Dimension Inspection Machine, shown below, the Isoma Hardness Tester and the Isoma Toolmaker's Microscope.

The Multi-Dimension Inspection Machine is manufactured by the Sigma Instrument Co., Ltd., of Letchworth, England. This unit, designed for 100% inspection, checks work pieces simultaneously for inside and outside diameters, depths, profiles, tapers, concentricity, squareness of surfaces, threads and other characteristics. The inspection results are indicated by signal lights on a panel; for O.K. within limits, a master green light; on the plus side, a yellow light for each dimension; on the minus side, a red light for each dimension. As many as 28 dimensions of a turbine blade can now be inspected simultaneously at a rate of 300 pieces per hour.

This machine is available for hand, semi-automatic or completely automatic operation; it is made up of standard units—bases, light boxes, measuring gages, fixtures and sorters. The various components can be changed rapidly for inspecting different parts. The

tips of the measuring gages, work holders and loading magazines or hoppers are the only special parts required for individual set-ups.

Depending upon the type of equipment and parts to be inspected, the Sigma machine will check up to 10,000 pieces per hour. The fully automatic machine is equipped with a device to sort pieces into three or more groups; those that are O.K., those which can be corrected, those to be rejected and those to be graded if required.

The basic checking unit, an electric signal gauge, measures repeatedly to within .00005". The anvil is of dovetail form so that detachable contact tips can be fitted to suit individual work pieces.



**Convince Yourself  
AT NO COST!**



**DIXON**  
**Natural Graphite**  
**MAKES**  
**BIG DIFFERENCE**  
**IN LATHE CENTER LUBE!**

• You know what a problem it is to stop wear, scorching, burning and breakdown at lathe centers. White lead and ordinary grease are a help . . . but that's all.

It takes Dixon Graphite Lathe Center Lube to really lick this problem. That's because this lube combines Dixon *Natural Graphite* and an extreme-pressure lubricating compound to provide *great film strength*. One user writes, "Your lubricant has eliminated burning entirely and we are enabled to use centers almost indefinitely, and run at greater speeds without undue heating."

But *you convince yourself*. We'll gladly send you a handy tube **ABSOLUTELY FREE**. Try it . . . and we're sure you'll be delighted with the results.

**ALL YOU NEED DO** is write to us (letter or post card), requesting free sample. Just give your name and position, and your company's name and address. Joseph Dixon Crucible Company, Jersey City 3, N. J.

**DIXON**  
*Graphite*  
**LATHE CENTER LUBE**

Sold through Distributors



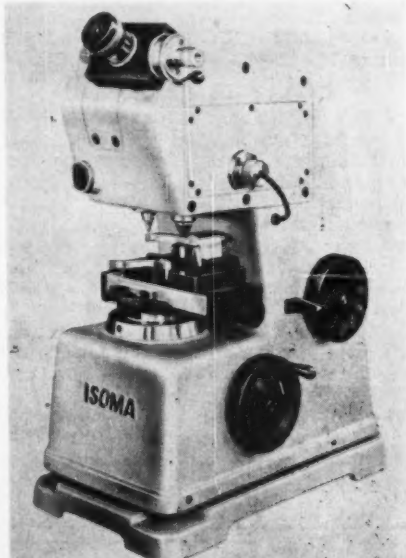
The anvil assembly is connected to the main frame by two flat springs; light contact pressure is maintained by a coil spring.

The movement of the anvil is transmitted through a knife edge to a small pivoted assembly to which is fixed an arm, on the outer end of which is a spherical contact, with restricted movements.

The signal gauges are made in four types, with measuring ranges of from .060" to .010" and with graduations of from .0003" to .00005".

### **Isoma hardness tester for Vickers numbers**

The Isoma hardness tester for measuring Vickers values on small round and flat metal parts, foil, tinplate, glass, plastics, etc., has also been introduced by the Cosa Corporation. This hardness tester is equipped with an automatic weight selecting device for applying dead weight loads from 50 to 1000 grams. The minimum thickness of



flat pieces to be tested is .0005". The minimum diameter for rounds is from .0003" to .0005". The maximum distance between the indenter and the table is

2 13/64". The built-in optical measuring system permits measuring impressions accurately to within .000004" (four millionths of an inch).

The standard equipment for this device includes an optical measuring system, a transformer for 110 or 220 volts, a base plate, test block, spare bulbs and a table of equivalent values. Special supports and clamps are available for holding thin material and extremely small parts.

### Isoma toolmaker's microscope



Cosa Corporation has also introduced the Isoma Toolmaker's Microscope, designed especially for measuring watch and instrument parts, extremely small screw machine parts and similar items.

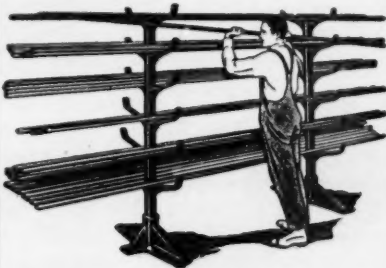
These microscopes have interchangeable objectives for 20X, 30X, 50X or 100X magnification; a 360° angle measuring device, fully graduated and numbered every 10 minutes; adjustable illumination for top and underneath lighting of work piece, and other support and holding accessories. The micrometer spindles are calibrated in .005" and .00005".

Two models designated M-101 and M-102 are available. Except for the size of the object table and spindle travel, both are of identical construction; objectives and accessories are also interchangeable. The object table of the Model M-101 is 3 1/4" square; crosswise and lengthwise travel of micrometer spindles is 11/16". The object table of the Model M-102 is 3 7/16" x 3 3/8"; spindle travel lengthwise is 1 1/4", crosswise, 1 3/16".

Included as standard equipment is a built-in transformer for 110 or 220 volts underneath light, an angle measuring device and a specimen support with spring clamp and 30X objective.

## SPEEDS UP STOCK-ROOM SERVICE

The BROWN TIME-SAVING RACK saves the time previously lost end-hauling each bar of stock its entire length from the old-style, closed-side Rack, the Brown Rack requiring but a few inches of side movement. Each length, width and thickness of stock is displayed in gold-fish visibility for instant selection. Workmen waiting for stock are served without waste of time, and returned to their production machines to turn out a maximum of output.



Any time you require additional storage space, all you need do is add more units. If you want to relocate it at any time, you can do so quickly for it is unattached to the building. It is a simple, durable article made of metal in five styles. It can't burn, warp, sag or twist; depreciation is practically nil.

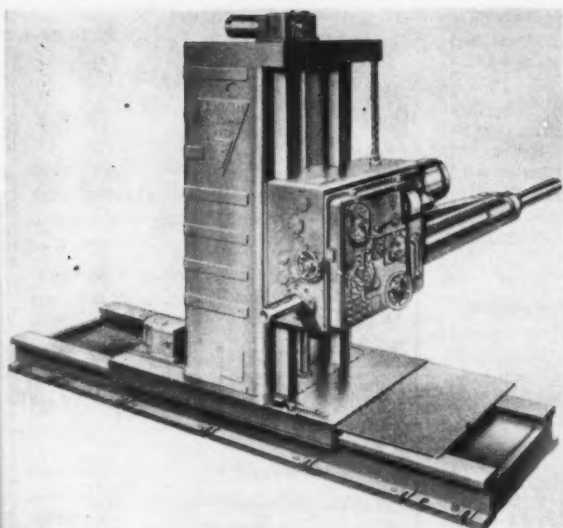
SEND FOR BULLETIN No. 26-M DESCRIBING—

BROWN'S *QUICK-SERVE* RACKS

**BROWN ENGINEERING CO.**

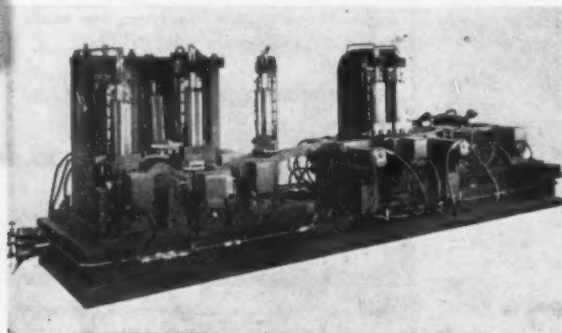
126 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS



**42" spindle travel is a feature . . .** of this heavy duty Horizontal Drilling and Tapping Machine recently introduced by Kaukauna Machine Corp. The box type column has great strength and accuracy. Headstock is counterweighted and is provided with rapid traverse and electric inching through a power driven screw with the head traverse motor. Over-travel is prevented by limit switches.

**This Danly hydraulic machine . . .** pierces the holes in the flanges and web of automotive frame side bars in one operation. The action of each cylinder features automatic hydraulic blankholding and stripping action.



### **Heavy duty drilling tapping machine**

A new heavy duty Horizontal Drilling and Tapping Machine has been introduced by Kaukauna Machine Corporation, Kaukauna, Wis.

Column rigidity, unusual power, wide range of movements, simplified operation and power positioning have all been built into this rugged, machine to provide high production on large, unwieldy workpieces, as well as on small production parts. It is designed and built throughout to give extreme accuracy, increased power and greater range of operations. It will drive boring fixtures and perform efficient drilling, reaming, boring, counterboring, tapping and spot-facing operations at the highest feeds and speeds possible with modern cutting tools.

The box type column is heavily ribbed for greater rigidity and accuracy, and the 4" diameter flame-hardened spindle with 42" spindle travel slides in a hardened steel sleeve mounted in precision Timken taper roller bearings. The spindle drive motor may be from 10 to 20 h.p. and the spindle is fitted with No. 5 or No. 6 Morse taper, with 18 speed changes through sliding gears actuated by a rotary dial selector lever.

All controls are grouped at the front of the headstock, within easy reach of the operator. The pilot wheel is internally clutched, overload protected and graduated to 6" for depth control drilling and tapping with automatic feed kick-out at the pre-selected depth. The headstock is counterweighted and is provided with rapid traverse and electric inching through a power driven screw with the head traverse motor located on the sheave bracket. Traverse rate is 80" per minute; overtravel is prevented by limit switches.

Runway slides are heavily ribbed semi-steel castings guided and gibbed to the runways and contain a 3 h.p. gear motor and worm reduction to traverse column along the runway. A screw-type runway slide clamp is interlocked electrically to pushbutton controls, and limit switches prevent overtravel.

#### **Danly hydraulic metalworking equipment**

To facilitate the piercing and sizing of holes, and to simplify other special operations, Danly Machine Specialties, Inc., 2100 S. Laramie Ave., Chicago 50, Ill., has announced the manufacture of a new line of hydraulic metalworking equipment.

Originally patented by the Mueller Engineering Co., Dearborn, Mich., these hydraulic machines are finding increasing applications in the automotive and aircraft industries.

The range of applications is said to be due to the special features contained in the hydraulic cylinder, which is the basic unit of the machine. Built-in blankholding and stripping action, which is entirely automatic and requires no springs, is actuated hydraulically after the power stroke. It is said that the inherent compactness and rigidity of this construction permits producing holes under difficult conditions, such as punching steel that is thicker than the hole diameter. In one instance, it is reported that 21/64" diameter holes are punched in 5/16" thick high carbon SAE 1095 steel, heat treated to 41 Rockwell C.

The principal features of the hydraulic system include continuous pressure in-

## *Buy KIPP AIR GRINDERS Because*

The RPM's stay up while grinding ... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work — longer wheel life.

*Buy Kipp air tools for best results, lower prices.*

MODEL JA  
50,000 R. P. M.  
**\$42<sup>00</sup>**  
IN U. S. A.



Weight 12 ounces;  
length 6 3/4 inches;  
chuck size 1/8 inch.  
Wheel guard re-  
moved for better  
illustration.

**MADISON-KIPP CORP.**  
207 Waubesa St., Madison, Wis., U.S.A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

tensification which permits wide flexibility in adding cylinders in the circuit of the power unit. A patented transfer valve permits handling high pressures while eliminating hydraulic shock in the circuits. These features are the basis for capacities up to over 200 tons in relatively small compact cylinders. Other applications for these hydraulic machines are found in small piercing units and riveting machines.

#### **Collar edging rolls for sheet metal pipe**

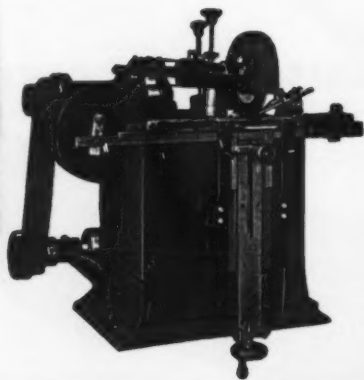
Collar edging rolls have been developed by Niagara Machine and Tool Works 637-697 Northland Ave., Buffalo 11, N. Y., which prepare a round sheet metal pipe for joining with a flat sheet. The contour of the rolls raises a substantial bead above the surface of the pipe and at the same time crimps the edge so that it is smaller than the pipe diameter (see illustration). The crimped side of the bead is flat so as to provide a good seat for the sheet. Due to the unusual height and shape of the bead, the

diameter and concentricity of the hole in the sheet cut to receive the pipe is not especially critical. Also, the crimped edge can easily be peened over to form a tight joint with the sheet.



The rolls are made of alloy steel, hardened and polished. They are available for the No. 164 Niagara Universal Rotary Machine using 24-page mild steel maximum, and for the No. 172 Electric Combination machine using 20-page maximum.

## **Get three or four times as much service out of hack saw blades**



Savings in blade purchases alone can pay for this grinder the very first year. Instead of one or two sharpenings per blade the EC Combination Circular, Hack and Band Saw Grinder enables you to sharpen them five or six times before discarding.

The EC is a precision sharpener, the only grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. This unique feature enables operator to grind a variety of blades without dressing or changing wheels. Write for Bulletin on EC Metal Cutting, Circular, Hack and Band Saw Grinder. Wardwell Mfg. Company, 3165 Fulton Rd., Cleveland 9, Ohio



# **WARDWELL**

**Maker of largest line of  
saw and tool sharpening machines**

# RIMAT DIAL BORE GAGES

FOR PRECISION  
MEASUREMENT OF:  
"O" RING GROOVES  
SNAP RING GROOVES  
THREAD RELIEFS  
ETC.

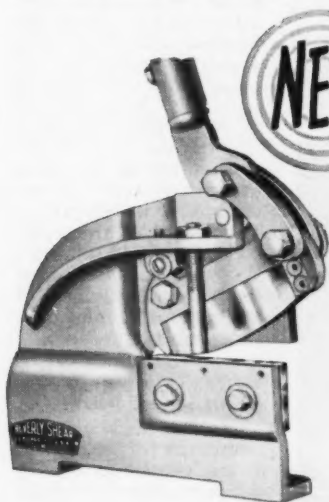
Instantaneous  
Readings



THE ORIGINAL INDICATOR GAGE  
DESIGNED FOR MEASUREMENT OF  
INTERNAL GROOVE DIAMETERS

For Information Write To

RIMAT MACHINE TOOL CO., 1123 Air Way, Glendale 1, Calif.



**NEW**

## Beverly SLITTING SHEAR

**MORE POWER . . . Easier Cutting**  
**EXCLUSIVE DESIGN . . . Cleaner Cuts**  
**RUGGEDLY BUILT . . . Last a lifetime**  
**CAPACITIES TO 3/16"**

Get faster, easier slitting and trimming with a new design Beverly "SS" Series Slitting Shear. Rigid, strongly braced frame; compounded linkage and extra strength where needed. Many exclusive features. Write for FREE illustrated Bulletin

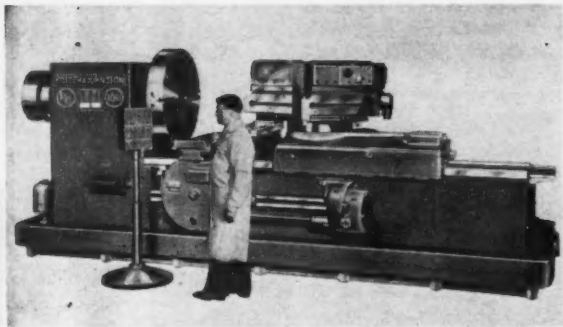
See your Beverly Distributor today.

Ask for a demonstration—no obligation.

SS-3 3/16" slitting cap;  
5/16" trimming; 1/4"x2"  
bar capacity.

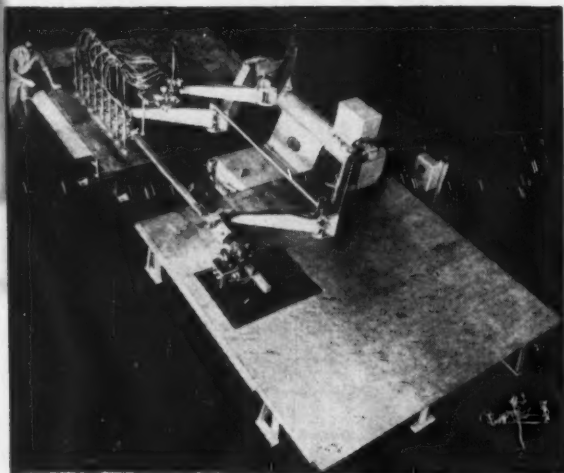
**Beverly SHEAR MFG. CO.**

3005 W. 111th STREET • CHICAGO 43, ILLINOIS



**Potter & Johnston Model 10-U** . . . automatic turret lathe is shown above. Designed with a 75 h.p. multi-v-belt drive, magnetic clutch and brake, this unit will handle large jobs. A 49" diameter swing over the base ways and a 36" diameter swing over the cross slides for chucking is provided, as well as a 27" diameter swing over the cross slides for machining.

**The Airco No. 50 Travograph** . . . pantograph type gas cutting machine. This unit cuts a wide variety of shapes from steel plates, billets and forgings. Note the rigid rail assembly, providing a smooth runway for the carriage. A self-contained Thy-mo-trol carriage drive motor unit provides stepless variations in the carriage speeds from 2" to 168" per minute.



## **P & J automatic turret lathe**

The Potter & Johnston Co., Pawtucket, R. I., has announced its Model 10-U—the latest addition to the P&J line of Automatic Turret Lathes. The 10-U is designed to handle big jobs and is equipped with a 75 h.p. multi v-belt drive, magnetic clutch and brake. There is a 49" diameter swing over base ways, a 36" diameter swing over cross slides for chucking and a 27" diameter swing over cross slides for machining.

Individual front and rear cross slides, operating from separate timing boxes, can be controlled independently or simultaneously with the movement of the turret slide. Having a 25½" adjustment along the bonded tool steel base ways, the front and rear cross slides and selected tools may be positioned to work from the rear and on the face of the work piece at the same time that the turret tools are machining. The travel of the cross slides is fixed at 8½". The manufacturer states that such flexibility of tooling speeds up precision production and materially reduces costs.

Distances from spindle to turret are listed as a minimum of 30" and a maximum of 50". Distance, center to center, between the 5" wide base ways is 31". This, plus four automatic changes of spindle speed and three automatic changes of feed for each

set of pick-off gears, working in combination with unique tooling of cross slides and turret, are said to provide heavy industry with the most outstanding machine for its capacity.

Because starting and stopping large motors on big machines place a heavy load across the line, the 10-U Automatic Turret Lathe is equipped with multi v-belt drive and a large magnetic clutch and brake. In operation, the main motor runs continuously; the spindle is started, stopped and jogged by the clutch and brake at the motor. High current inrushes are confined to initial starting and shutdown.

The Model 10-U includes full electro-pneumatic control, hardened and ground speed gearing, air operated chuck and a centralized control station for operating air chuck and all machine functions. Streamline machine design provide complete accessibility to work, machine and controls.

### Airco pantograph type gas cutting machine

Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., a division of Air Reduction Company, Inc., has announced the Airco No. 50 Travograph, the latest addition to its complete line of high quality gas cutting machines.

It is shown in the illustration at the bottom of the opposite page.

This new heavy duty pantograph type cutting machine is designed with built-in accuracy for precision cutting. Guided by either manual, magnetic or electronic tracer, this unit is stated to be able to cut an unlimited variety of shapes from steel plates, slabs, billets and forgings, and makes practicable and economical the cutting of either one or a few parts or identical parts on a quantity production basis.

All welded, heavy gage steel construction gives this machine great strength. The rigid rail assembly, made of specially rolled tracks with accurately machined surfaces, provides a smooth carriage runway. Guide rollers on the carriage base keep the carriage on a true, vibration-free course. Flame hardened carriage wheels insure long service life. A precision-machined

## SPECIFY KASSON PRECISION COLLETS AND ATTACHMENTS

IMMEDIATE DELIVERY FROM STOCK



**KLUTCH-KOLLET**  
Stop collet for accurate chucking to .25" dia. Soft head for easy boring. Lowest price on market! Models 3AT, 3C, 5C.

FOR ATLAS • LOGAN • SOUTH BEND CRAFTSMAN • SHELDON LATHES, ETC.



Let us quote on your quantity orders for any type of collet, live center or other machine tool attachment!



KASSON Precision products are guaranteed unconditionally for accuracy, fit and long life. Your dealer should have them . . . Write us for literature!

GENERAL DIE AND STAMPING CO.  
Integrity Since 1919  
264 MOTT STREET • NEW YORK 12, N. Y.

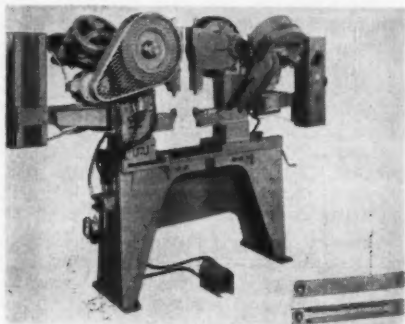
operating bar affords easy movement of torch holders. The large diameter ball bearings incorporated in the pantograph arm hinges and the operating bar result in smooth, accurate response to the movement of the tracer. The Thymo-trol controlled carriage drive motor unit is self-contained and provides stepless variations in carriage speeds from 2" to 168" per minute. The carriage remote control box can be mounted on the operating bar along with the remote controls for the gas distribution system and other auxiliary equipment to provide the utmost in convenience.

### Machine sets two nuts at once

Two new double "Clinchor" units have been furnished to Ternstedt Division, General Motors Corp., Detroit, by The Tomkins-Johnson Co., Jackson, Mich.

These machines are tooled to feed and set two  $\frac{3}{8}$ " x  $\frac{1}{2}$ " x  $\frac{3}{16}$ " thick Fabri-Steel nuts at each operation. The anvil position of the left hand Clinchor is adjustable in a front-to-back direction, and also with respect to height.

The anvil position of the right hand Clinchor is adjustable in a left-to-right direction. Both Clinchors are tripped by the same foot-operated valve. Samples of the work, front and back view,



are shown in the accompanying illustration, at the lower right.

The 35-year-old Tomkins-Johnson Company also manufactures air and hydraulic cylinders, Rivitors, cutters and air controls.

## How SQUARE HOLED SLEEVES SPEED UP TOOL-MAKING!

One of the most difficult problems in tool making can be solved easily and quickly with Sturdy Square Holed Sleeves. The perfection of broached square holes can be had in boring bars, milling cutters and many other applications at a small fraction of the cost of imperfect hand-made square holes. The Sturdy Square Holed Sleeve consists of a round sleeve with a perfectly square hole broached through the center. This hole is tapped at one end to receive a back-up screw which is furnished with the Sleeve. The Sleeve can be sweated or pressed into a drilled and reamed hole to make a perfectly square accurate hole in a very few minutes.

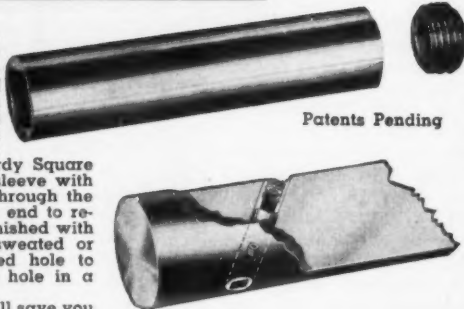
The Sturdy Square Holed-Sleeve will save you many hours and many dollars in the making of boring bars, tool holders and other tools requiring square holes.

BUSHINGS MADE IN FOLLOWING SIZES:  
3-16, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 1"

**STURDY BROACHING SERVICE**

23516 TELEGRAPH ROAD

DETROIT 19, MICH.



Patents Pending

*Write for  
Literature*

# STOP DUSTS INSTANTLY

with

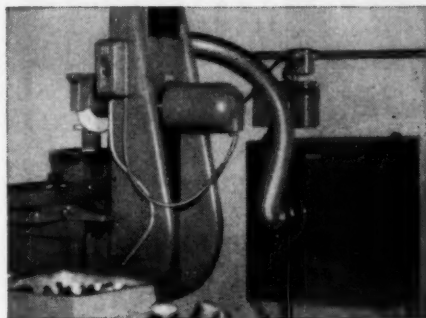
## DUSTKOP

Available from stock of 22  
standard models

300 cfm to 10,000 cfm

**for:** Surface Grinders, Tool and Cutter Grinders; Polishers and Buffers; Abrasive Belts and Discs; Woodworking and Plastic Industry Equipment . . . DUSTKOPS collect almost all kinds of industrial dusts.

Ask for Catalog 605-2. Describe dust problem for recommendation by return mail—no obligation.



### AGET-DETROIT CO.

205 Main St.

Ann Arbor, Michigan

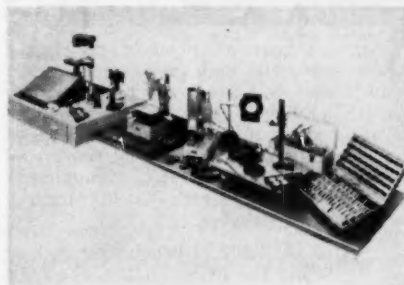
### Inspection laboratory conforms with government regulations

The George Scherr Co., Inc., 198 Lafayette St., New York 12, N. Y., has recently introduced an assortment of measuring tools and instruments capable of performing all ordinary operations to measure and inspect thickness, length, diameters, forms of tools, templates and dies, pitch, lead and form of screw threads, visual inspection of finish, circular divisions and graduations, etc. The assortment is known as the "Scherr Limited Budget Laboratory."

Shown in the illustration, from left to right, are the Wilder Micro-Projector, vertical design, of from 10 to 100 magnifications; a binocular 3-dimensional microscope for surface finish inspection; a toolmakers' microscope for 1" x 1" coordinate measurements and thread checking with optical templates; the Opti-Comparitol for measuring and inspecting precision parts; illuminated magnifiers; Chesterman height gages available in sizes of 12", 18", 24", 40"

and 48"; Ultra-Check gage block, of 5-millionth accuracy, in three different sets; assorted micrometers and snap gages.

The new Scherr Laboratory conforms with two recent U. S. Government



regulations of the Rearmament and Defense Program, for contractors of aircraft and associated equipment, according to which, each supplier is required to provide adequate inspection facilities in the plant to accomplish the necessary inspection operations.

**1500° F. IN  
5 MINUTES**

Quick-Acting  
**JOHNSON**  
No. 120 Hi-Speed  
FURNACE  
**\$14550**  
F.O.B. Factory



**2300° F. IN  
30 MINUTES**

Turn the heat on production. Heat treat carbon and high speed steels, dies and tools in your own plant with JOHNSON No. 120 Hi-Speed. Fast heat-up saves time and gas. Temperatures easily regulated with accuracy. Firebox: 5 x 7 $\frac{3}{4}$  x 13 $\frac{1}{2}$ . Complete with Carbofrax Hearth, G. E. Motor and Johnson Blower.

Also available in bench style.  
Write for Free Catalog.

Johnson Gas Appliance Co.,  
570 E Avenue N.W., Cedar Rapids, Iowa

**JOHNSON**

**FURNACES FOR INDUSTRY**

**Band machine has wide speed range**

The DoAll Company, DesPlaines, Ill., announces a general purpose Contour Sawing Machine designated as Model V-36-3. This machine takes continuous saw, file or abrasive bands up to  $\frac{1}{2}$ " in width. It features a 3-speed transmission and speedmaster drive providing variable tool velocity ranging from 25 to 6,000 f.p.m. With this speed range,



it performs all types of conventional metal sawing or filing, high speed cutting of non-ferrous metal and composition materials and light gauge alloy friction cutting.

This machining adaptability is incorporated in a relatively light unit-welded steel frame 81" high, requiring only 40" x 76" floor space. This represents an economy in cost as well as floor space, compared with two or more machines that would be required to equal this single machine's versatility resulting from its wide speed range.

The V-36-3 is stated to be particularly useful in aircraft production, sheet metal, and pattern shops where its 36" throat capacity is advantageous. This model normally carries the saw band over three wheels, but when the band becomes too short after several welds, the band may still be used to its full

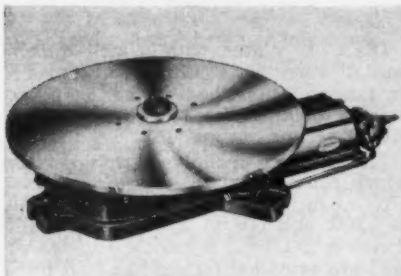
life over two wheels on work requiring no more than a 16" throat.

The new model is completely equipped for general purpose contour hand machining. It includes built in blade welders with squaring shear, motorized grinder and thickness gauge, assorted band tools and guides, automatic power feed, job selector dials, speed indicator, dust spout, adjustable light, chip blower, etc. Its variable tool speed and variable feed pressure are controlled and correlated by handwheels convenient to the operator. Cutting tools are guarded to the point of work. The machine uses a 3 h.p. drive motor and magnetic starter with push button control.

### Bellows heavy duty dial feed

An electrically controlled, air-powered rotary work feeder with a 22" diameter table top, has just been announced by The Bellows Co., 230 W. Market St., Akron 9, Ohio.

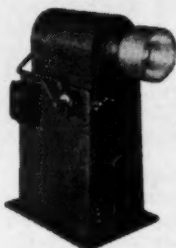
The new dial feed table (Model BRET-22) can be set to position 4, 6, 9, 12, 18 or 36 stations. The 22" diameter table will position quickly and accurately loads up to 1000 lbs. Cushioned air power eases the table into position gently, where it is locked by an air cylinder.



The table is powered by a special 3 5/8" bore Bellows Air Motor, complete with built-in Electroaire directional valve and speed controls. The valve is controlled by Bellows 12-volt solenoid control units which are guaranteed against burnout. The table top is easily removed for mounting jigs and fixtures, or oversize tables.

# SCHAUER

## SPEED LATHES



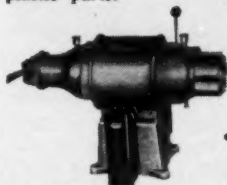
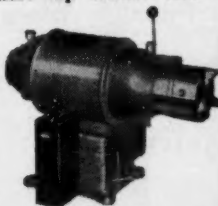
### Who Uses Them?

General Electric • Aluminum Co. of America • Studebaker • Thos. A. Edison • Ford Motor • Westing-

house Electric • Owens Illinois Glass • Lockheed Aircraft • Western Gear Works • Bryant Electric • Royal Typewriter • Yale & Towne • Eastern Airlines • Minneapolis Honeywell • Remington Arms • American Locomotive • American Brass . . . and several hundred more top drawer companies!

### Why?

Because Schauer Speed Lathes cut from 30% to 90% off the cost of polishing, filing, lapping or de-burring small metal and plastic parts!



• Chuck, collet or vacuum holding fixtures.

- Single speed, two-speed or variable speed models.
- **SAVE WITH SCHAUER! Write for Bulletin 500.**

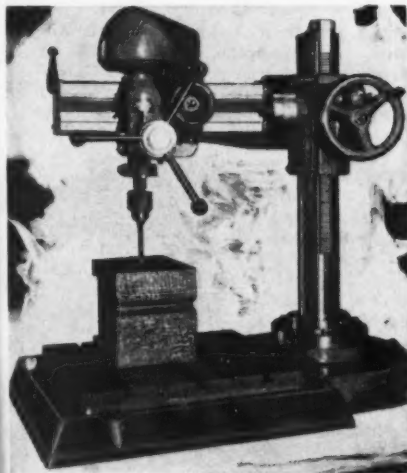
**SCHAUER MANUFACTURING CORP.**

Originators of Today's Speed Lathes  
2064 Reading Rd., Cincinnati 2, Ohio

### The "Zewo" bench radial drill press

A versatile sensitive bench Radial Drill Press is represented in the "Zewo," nationally distributed by Capitol Machinery Corp., 197-199 Mott St., New York 12, N. Y. This machine is specifically designed for drilling, tapping and light profiling operations. It is said to be suitable for working on heavy or cumbersome work pieces where it is easier to spot the drill-head than to move the work. The "Zewo" is stated to be capable of handling all drilling and tapping up to  $\frac{1}{2}$ ", with the efficiency of a heavier machine.

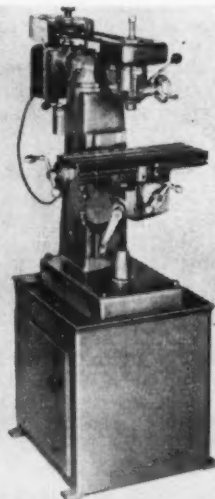
The machine is constructed with a ball bearing column support and a ball bearing working-head on a 90° tiltable radial arm; the radial arm swings a full 180°.



The table working surface is 19"x 16 $\frac{1}{4}$ ", with three T-slots. The 19/32" diameter spindle has a travel of 3 $\frac{1}{2}$ ". The column diameter is 4-5/16". Vertical adjustment of the arm is 17". The "Zewo" bench radial drill is provided with four spindle speeds at 60 cycles, of 840, 1200, 2400 and 3600 r.p.m. The required power for the machine is a standard 1/3 h.p. electric motor; the drive is by a 4-step V-belt pulley. The over-all height of the unit is 35 $\frac{1}{4}$ ". It occupies a floor space of 37" x 21 $\frac{3}{4}$ ".

### Vertical miller designed for accuracy of operation

A vertical milling machine featuring rigidity, flexibility and a wide range of operation, is introduced by the Johansson and Windle Co., 6015 Dalin Drive, Skokie, Ill. All feed screws are precision ground and mounted in pre-loaded ball bearings. The large dials are 3 3/16" in diameter and graduated into 100 increments.



Dials are plated with a satin finish, and all other parts subject to corrosion or tarnish are either plated or black oxidized, making the machine both an attractive and lasting unit.

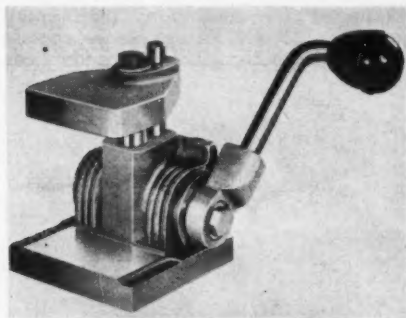
The machine includes a milling unit which provides spindle speeds (with a 1725 r.p.m. motor) of 180 to 1,000; 350 to 1,900; and 600 to 3,250 r.p.m. Quill travel is 2 1/16". A handle and wheel feed are provided for drilling and boring operations. Additional features include a positive quill lock and micrometer depth stop graduated in thousandths of an inch. A No. 7 B. & S. or No. 2 Morse taper spindle is optional.

The longitudinal feed of this machine is 12"; cross feed is 4 $\frac{1}{4}$ "; vertical feed of knee is 12"; maximum distance from the spindle to the table is 12"; mini-

mum distance to table, 0"; maximum distance from spindle to column is 8 3/4"; size of table, 6" x 18"; approximate weight of the machine is 600 lbs; height is 60"; approximate floor area required, 35" x 38".

### Drill jig has infinite locking positions

A single-post drill jig, providing accurate alignment and "touch-release" locking, is offered by Esco Engineering



Corp., 1940 E. Woodbridge Ave., Detroit 7, Mich. Called the Esco Mijit B-6, it is recommended for drilling small parts and for short and medium size runs, where most costly fixtures and tooling cannot be justified. Salvage is stated to be upwards of 60% by changing adaptors and bushing plates, supplied from stock by the manufacturer.

The Esco B-6 provides an infinite number of locking positions, due to its patented cam action. This feature is said to cut loading and unloading time to a few seconds. Locking is positive and requires no pressure, yet it releases instantly with a slight lift of the locking handle.

The base and top plate are accurately machined, as is the right angle of back to base for optional use in a side or lying-down position. Accurate alignment between bushing plate and base is maintained by means of a hardened and ground post and alignment dowel. The post also serves as a raising and lowering rack, with a one-inch stroke.

December, 1951

## do you have a TOOL PROBLEM

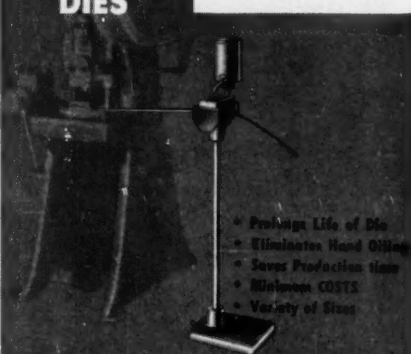
Columbus Die-Tool has been solving tooling problems for over 45 years. Expert designers and builders of all types of tools and special machinery. Write us today!

**COLUMBUS DIE-TOOL**  
*and Machine Co.*

P. O. BOX 750 • COLUMBUS, OHIO

**SAVE  
YOUR  
DIES**

**DURANT  
Stock Oiler**



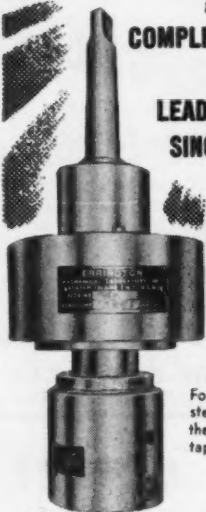
Write for free catalog sheet

**DURANT TOOL SUPPLY CO.**  
155 ORANGE ST., PROVIDENCE 3, R. I.

# ERRINGTON TAPPERS . . .

the  
COMPLETE LINE . . .

the  
LEADING LINE  
SINCE 1891



## FRICTION

For blind holes, tapping in steel, copper, etc. wherever there is danger of breaking taps.

Errington specializes in the manufacture of high speed multiple drilling and tapping attachments. The name Errington is your assurance of top-quality products . . . your assurance of the finest and most modern tools to produce first-grade workmanship at minimum operating costs.

## QUICK-CHANGE

Tool-Holders to Drill, Tap and Set Studs, etc., without moving work, or stopping or reversing machine. Individual friction adjustment in each tap-holder, if required.

## POSITIVE

For through holes where work is drilled and then re-handled and tapped.

## BALL BEARING CONE-DRIVE

Designed for Ball Bearing High Speed Drill Press.

These Tappers may also be adapted for button or acorn die threading.

Write for Complete Information

**ERRINGTON Mechanical Laboratory, Inc.**

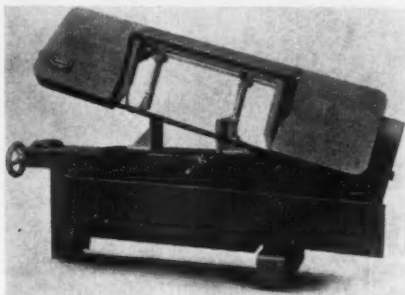
Established 1891

Main Office and Plant, STATEN ISLAND 4, NEW YORK

## Metal cutting band saw

A new heavy duty metal cutting band saw, Model 1220, which will take upward of 12" rounds or flat stock up to 12"x20", is announced by Kalamazoo Tank and Silo Co., Machine Tool Division, 421 Harrison St., Kalamazoo, Mich.

The machine is available in two models, one for dry cutting on intermittent operation or for nonferrous metals (1220-S), and the other coolant-equipped for continuous high speed cutting (1220-C). Except for the coolant equipment, both machines are identical.



The Model 1220 is provided with many features necessary for lower unit cutting costs and high speed production—intermittent or continuous. It cuts to an accuracy of a few thousandths, with no burr and a minimum kerf, maintaining its precision from the start to finish of the cut.

The machine has four cutting speeds, 61, 108, 165, 259 f.p.m., a four-step cone pulley on the 1 h.p. motor and drive shaft providing the variations. This gives a wider choice in matching the cutting speed to the material and cut size. Changes to the different speeds are fast and easy. Power on the saw is automatically cut off at the end of any cut.

A 1-inch blade, 13'-11" long, is used providing faster more accurate cutting. Frame counterbalance is adjusted by a cam device which has five different spring tensions. A dash pot mechanism adds further adjustment to each setting with a twist control at the operating end.

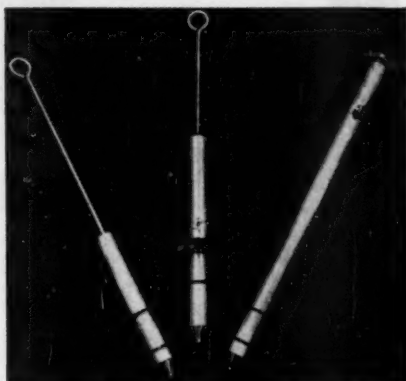
All wheels and moving parts are enclosed; the only part of blade exposed is the actual cutting section. At the same time an unobstructed view of the cutting operation is afforded. The machine is readily portable for its size (87"x26" floor space), by means of casters, two stationary and one swivel.

### Multifinish tubular Magnetools

A new line of hand operated load-releasing tubular Multilift Magnetools is announced by Multifinish Mfg. Co., Dept. 429, 2114 Monroe Ave., Detroit 7, Mich. The magnets are used for entering small openings such as blind holes, for removing boring chips from castings. They are especially designed to remove steel chips or parts from other steel surfaces, chips from metal cutting machines, etc. A patented brass pickup tip prevents sticking.

Other Magnetool uses include picking up steel chips and parts from hard-to-reach places, around machinery, conveyors and benches, removing chips and metallic sludge from coolant tanks, and

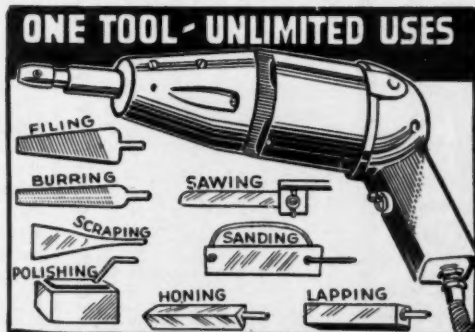
boring into tumbling media or carburizing materials to remove parts.



Magnetools are said to be permanent and not electric; they are resistant to water, oil and gasoline. Five different models for varying job requirements are included. Diameters are  $\frac{1}{16}$ ",  $\frac{3}{16}$ ",  $1\frac{1}{8}$ " and  $2\frac{1}{2}$ ".

## CUT PRODUCTION TIME!

Use these Handy PORTABLE, ELECTRIC RECIPROCATING TOOLS for Greater Production, Better, More Uniform Work — All with less Operator Fatigue. Fixed strokes are  $\frac{1}{8}$ " or  $\frac{3}{16}$ " long. Operate on 110 Volts AC-DC. Deliver 1000 PUSH-PULL strokes per minute. Try one of these tools on your next job.

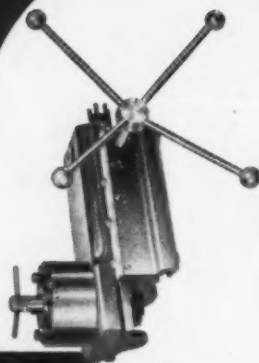


Send for Descriptive Literature.

**ACME TOOL COMPANY**  
71 WEST BROADWAY NEW YORK 7, N. Y.

## CONVERT YOUR LATHE FOR PRODUCTION

You can convert your lathe to handle profitable turret lathe and screw machine work by installing a self-indexing Newton Precision Bed Turret. All production operations can be performed, plus operations normally done with the regular tailstock. ☆ It's designed for fast, heavy duty operation, accommodates six tools and offers precise repeating accuracy. The slide and bed have ground bearing surfaces to assure stroke accuracy. ☆ Investigate the profitable opportunities offered by a Self-Indexing Newton Precision Bed Turret. Available in lever-operated or pilot wheel models for the following lathes: 10" and 11" Logan, 10" Powr-Kraft, 10" Atlas, and 12" Craftsman. ☆ Favorable delivery dates. Ask your dealer for information or write direct.



SELF-INDEXING  
NEWTON PRECISION  
BED TURRET

— A. K. TOOL COMPANY 2029 Blake Avenue • Los Angeles 39, California —

## Fire extinguishers feature one-hand operation

Positive, one-hand operation is a characteristic of the Redi-Grip pressurized portable fire extinguisher recently added to its line by Stop-Fire, Inc., 125 Ashland Place, Brooklyn 1, N.Y. This model has been fully approved by Underwriters Laboratories, Inc. The Redi-Grip is adapted from a design now being used by the U. S. Air Force; it is available in 1, 2½ and 4 quart sizes and features a combination of charges — CBM (chlorobromomethane) or carbon tetrachloride, individually or in combination, and the expellant may be either air or carbon dioxide.



The Redi-Grip may be released from its bracket and operated with one hand, while a patented safety-lock prevents its accidental discharge. This unit has been designed for a wide range of industrial and institutional fire hazards. It features a removable head easily disassembled for inspection, cleaning or adjustment; a non-clogging nozzle, Teflon gaskets; silver soldered joints; a flexible siphon tube for maximum discharge at any angle and a drawn brass shell.

# High Temperatures for Small Quantities **HUPPERT** "Hi-Temp" **FURNACE**

**BENCH MODEL**—Complete as illustrated, I.D. 5 $\frac{3}{8}$ " **\$42500**  
x 3 $\frac{5}{8}$ " x 6"

Same as above **\$49500**  
I.D. 5 $\frac{3}{8}$ " x 3 $\frac{5}{8}$ " x 12"

**FLOOR MODELS**—\$50.00 add'l.



● This sturdy small furnace is designed for continuous operation up to 2200° F., or intermittent to 2250° F. Precision, low-cost operation makes it ideal for both laboratory and small run production. The "Hi-Temp" is equipped with automatic temperature control and has two pilot lights for indicating "ON" and "OFF" heating cycles. It employs Kanthal elements with fully enclosed contacts. Other noteworthy

features are multi-insulation — all-steel construction and counter balanced door. Current consumption is 2 KW (110 V AC only).

Write for literature giving detailed description of this and other Huppert Ovens and Furnaces.

**K. H. HUPPERT CO.**  
6845 COTTAGE GROVE AVE.  
CHICAGO 37, ILL.

*Manufacturers of Electric Furnaces & Ovens*

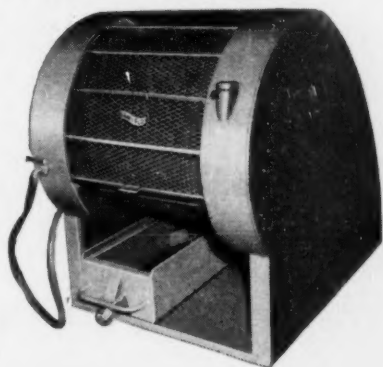
The range exceeds 30 feet and the discharge time of the 1-quart size is about 27 seconds at 70° F. For close fire fighting, this unit provides over 160° of effective extinguishing action from one standing position.

## **Grav-i-Flo tumbling machine**

The Grav-i-Flo Corp., 400 Norwood Ave., Sturgis, Mich. has added a new model tumbling machine to its line of equipment for use with the Grav-i-Flo tumbling process. With two 18"x40" i.d. compartments, the new Model 36-2 machine offers increased capacity per area of floor space over previous equipment, permitting the grinding, deburring and finishing of metal parts in larger quantities in faster time cycles.

The compartments are furnished with  $\frac{1}{8}$ " plate unlined, or  $\frac{1}{4}$ " plate rubber-lined; doors have cam locks with manually released safety stops to provide pressure relief; the magnetic starter has a reduced-voltage control to meet plant electrical standards. A lever is standard on the machine but

a push button switch is optional; a limit switch on the safety guard cuts off the current to stop the barrel rotation when the guard is lifted. The 220-440 volt, 5 h.p. motor has a magnetic brake. Water and electrical services are integral with the machine and are available for instant, convenient connections. The safety guard is counter-balanced for easy lifting.



## D & M AUTOMATIC PRESS GUARD



No  
Springs

•

No  
Cables

•

Fits Any  
Machine

•

Low  
Initial  
Cost

•

Low  
Maintenance

• This punch press guard meets the most exacting standards of safety engineers and safety laws. Permits operator to feed the press without hindrance.

Write for complete information.  
Immediate Delivery

### D & M GUARD Co.

897 Military Rd.

Buffalo, New York

For 50 Years  
**MOLINE "HOLE-HOG"  
MACHINE TOOLS**

HAVE SERVED  
AMERICAN INDUSTRY  
1901-1951

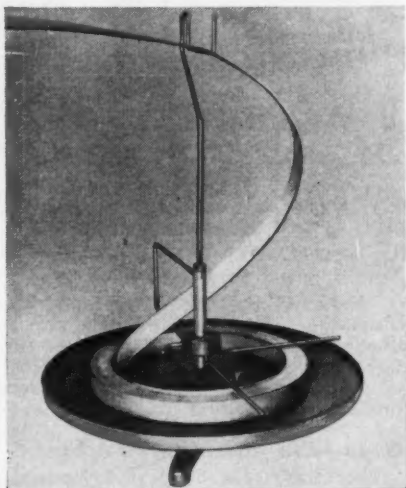


**DRILLING - BORING -  
HONING - TAPPING  
and SPECIAL MACHINES**

**MOLINE TOOL COMPANY**  
102 20th St. MOLINE, ILLINOIS

## Jaco horizontal reel for coiled stock

A horizontal stock reel which requires no power, designed to eliminate hitch or roll feed stoppages, has been introduced by Jaco Devices, Inc., 102 High St., Hingham, Mass. This ingenious device has been engineered to overcome the snatching action of coiled stock eccentricity, a common problem in all coil feed presses using conventional vertical-type reels. The Jaco reel provides for the stock to uncoil from a horizontal position on a ball bearing mounted turntable.



Instead of uncoiling the material from the outside of the coil, thus tightening the stock on itself, the Jaco Stock Reel takes the material from the center of the coil. The freely rotating coil is propelled by the natural spring of the material, which develops torque as it uncoils. This is accomplished by passing the end of the strip material, taken from the center of the coil, through a guide frame and over a support to the automatic feed on the press. The loop thus formed is shortened as the feed draws the stock from the coil, until the natural spring in the stock is sufficient to overcome the inertia of the platen and its load.

Should a reel speed exceed the rate of

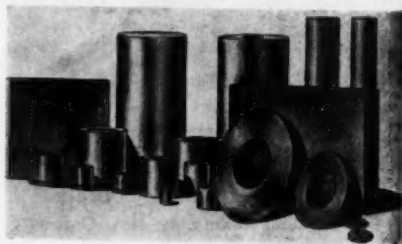
feed demand, the coiled material will retard the motion by internal brake action on the center of the coil, thus automatically maintaining the exact feed requirement of the press. Since there can be no tightening of the material as it is being fed, snatching of stock cannot occur.

The size and weight of the coil are stated to have no effect on the working efficiency of the reel, and there is no time lost in setting the coil up, to get it running true. All that is necessary is to place the coil on the turntable of the Jaco reel, pick up the inside end of the coil stock, and feed it to the press.

#### **Bost-Bronz bearings add 157 new sizes**

Boston Gear Works, 77 Hayward St., Quincy 71, Mass., announces a total of 157 additional sizes of Bost-Bronz Oil Impregnated Porous Bronze Bearings to meet the demand for a comprehensive range of stock sizes in cylindrical and flange bearings, thrust bearings, cored bar, solid bar and plate stock.

Bost-Bronz bearings are interchangeable with solid bronze bearings. In daily use with heavy or light loads, high or low speeds, static loads or shock loads, they are giving their users a number of important performance advantages.



Having an oil film to start on as well as to run on, they operate quietly and give long service. There is no oil drip or waste and there are no openings for grit, lint or dirt. Oil holes or grooves are eliminated, and with them the expense of machining. The complete range of sizes permits simple press fits.

## **COOLEY HEAT TREATING FURNACES**

**ELECTRIC BOX TYPE • FLOOR AND BENCH MODELS**

*For Tools and Small Parts*

**SHOWN HERE**



**THE COOLEY BENCH MODEL  
RECIRCULATING AIR DRAW**

Max. Temp.	Sizes	Price
1250°	10" x 6" x 14"	\$475

All prices are less controls. Any standard controls available for automatic temperature control.

#### **1. IDEAL FOR**

- aluminum and beryllium copper heat treating.
- closely controlled mild and high-speed steel tempering.

#### **2. Stainless steel lined chamber.**

#### **3. Accommodates up to 50 lbs. of parts.**

#### **4. Holds temperature uniformity +5°-0°F.**

#### **5. 4 kw. input at 230 v. assures rapid heating.**

*Brown and Wheelco Control Pyrometer carried in stock—available for all applications.*  
Free on request: ☐ COMPLETE CATALOG ☐ "SHOP NOTES ON HEAT TREATING"

# **COOLEY**

**ELECTRIC MANUFACTURING CORP.**  
36 SO. SHELBY • INDIANAPOLIS, IND.



100,000 stocked in 450 sizes for immediate delivery. Special r'd points within 48 Hrs. Order today & economize. Data sheets on request.

**Ring Punch & Die Co.**

108 Foote Ave., Jamestown, N. Y.

**SUPERIOR QUALITY**  
**DIAMOND**  
**WHEELS**

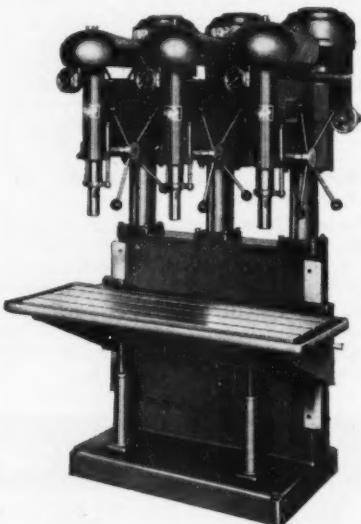
**TWO WEEKS DELIVERY**  
**ANY SIZE ANY SHAPE**

—◆—  
 WRITE OR PHONE

**FARMINGTON DIAMOND TOOL CO.**  
**28625 GRAND RIVER**  
**FARMINGTON, MICHIGAN**  
 Phone Farmington 1598

**Sibley multiple spindle drilling machines**

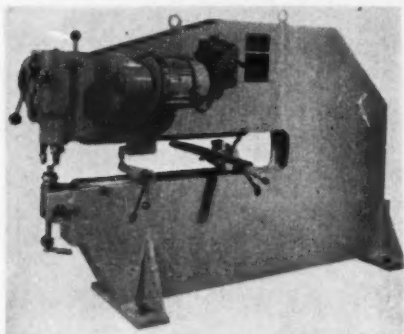
Sibley Machine & Foundry Corp., South Bend, Ind., has introduced a new design Multiple Spindle Drilling Machine. With three spindles mounted integral to a sturdy column, this Model ME-25 is constructed to operator efficiency on high volume production.



Its features include a big 25" swing, a variable speed drive from which the exact spindle speed may be obtained for any size drill from  $\frac{1}{8}$ " to 1", and an extra large table with coolant trough. The unit is powered by a  $1\frac{1}{2}$  h.p. Axial Air Gap Motor. Capacity of machine is  $\frac{3}{4}$ " in steel and 1" in cast iron. Distance between spindles is  $14\frac{1}{4}$ ". The table has a vertical adjustment of  $12\frac{1}{4}$ ". The working surface of the table is 45" x  $14\frac{1}{2}$ ".

The wide range of spindle speeds available may be obtained by a self-locking speed control convenient to the operator. There are no belts to change. A tachometer on the front of the machine provides accurate reading of speeds. Five options of spindle speeds each with a 4 to 1 ratio are available, ranging from a low of 206 - 825 r.p.m.

to a high of 540 - 2160 r.p.m., with 3 phase, 60 cycle motor. A speed chart on the side of the machine shows the proper speeds for different drill sizes.



**Pullmax cutting machine has 9/32" capacity**

The American Pullmax Co., Inc., 2627 N. Western Ave., Chicago 47, Ill., announces its new, improved 9/32" capacity Pullmax machine, Model D-3. This new unit has an increased throat clear-

ance which permits easier inserting and handling of bulky material. Due to this increase in clearance, the machine is equipped with longer cutting tools which are said to give longer life to the tools. The machine also features quick locking devices on both the circle and straight cutting attachments, enabling the operator to set up much faster, as no tools or wrenches are required.

The lower guide rail is graduated in inches which also helps to speed setting up time when cutting circle or squares.

The lower tool holder has been redesigned and improved for simpler setting and adjusting. The Model D-3 is also capable of beading, folding, slot cutting, nibbling and louvering, simply by changing tools and attachments for the various operations.

The box-type frame of the Pullmax D-3 is made of welded steel plate. All moving parts are enclosed and operate in an oil bath. Throat depth is 48" for clearance of large steel sheets.

## People work better when they SEE BETTER



**In the Bell Telephone Laboratories: Precision machinist working on a milling machine finds Magni-Focuser an invaluable seeing aid.**

MAGNI-FOCUSER's matched prismatic lenses give needle-sharp magnification. Comfortably light weight. Fits over regular glasses. Leaves both hands free. Normal vision may be resumed by lifting head.

## MAGNI-FOCUSER SPEEDS PRODUCTION

### Leaves both hands free to work

Precision workers do the job faster and more accurately with a Magni-Focuser—the proven binocular magnifier.

Gauge reading, layout work, inspection, tool and die work are just a few of the jobs that need the Magni-Focuser. Speeds precision assemblies, blue print work. Restores the usefulness of the skilled hands of many older workers whose vision needs a seeing aid.

Now aiding thousands of workers, the Magni-Focuser can help your plant produce better. Immediate delivery. 10-day trial without obligation. Return to us if not satisfied. \$10.50.

Send for descriptive folder

# EDROY PRODUCTS CO.

480 Lexington Ave.,  
Dept. 14, New York 17, N. Y.

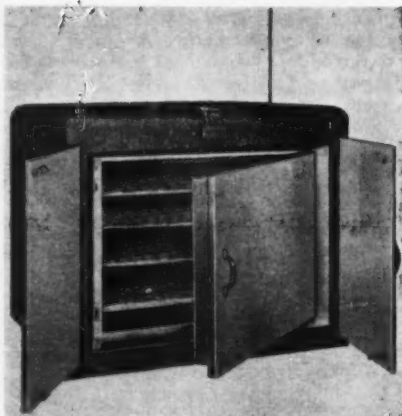
### Electric oven has 100°-800° temperature range

Announcement has been made by Grieve-Hendry Co., Inc., 1101 N. Paulina St., Chicago 22, Ill. of a new portable electric oven, called the Model HT, for processing at higher temperatures, such as required for stress relief of springs and plated parts.

This oven features uniform temperature throughout, the manufacturer states. The construction permits the nesting of one oven on top of another. Ovens can be used in groups or banks and can be operated individually, or selected ovens in the group can be cut out or heated at different temperatures.

The temperature range is 100° to 800°F.

The construction is of heavy gauge steel with Fibreglass insulation. The oven will operate from any 110 volt outlet. No special wiring is required. 220 volt units are available. A thermostat, outside reading thermometer and a pilot light are standard equipment as well



as a drip pan and lower shelf. Additional removable shelves and oven stand are available.

The size of the Model HT is 30" wide x 25" deep x 24" high, outside. Inside dimensions are 22" wide x 18" deep x 16" high.



SEND FOR COMPLETE  
SPECIFICATIONS AND  
ATTRACTIVE PRICE LIST

**MICO  
INSTRUMENT CO.**

78 Trowbridge Street  
Cambridge, Mass.

### A BETTER ENGRAVER AT LOWER COST

*The 2 and 3-Dimensional*

# MICO

Fills the long-felt need for a portable, inexpensive and dependably accurate machine for making small dies, molds, templates, etc. Extremely simple to operate.

#### NOTE THESE SUPERIOR FEATURES

- Engraves 2 or 3 dimensions.
- Pantograph permits 4 reduction ratios.
- Micrometric depth control graduated in thousandths of an inch.
- Entire spindle assembly removable to facilitate cutter grinding.
- Rugged cast iron construction with exclusive adjustments for insuring quick, accurate setting.

## AUTOMATIC MILLING CYCLE ...HYDRAULIC FEEDS

- ✓ for FAST MILLING
- ✓ on SMALL PARTS
- ✓ with CLOSE LIMITS
- ✓ and FINE FINISH

Get Complete Information In Our New  
Bulletin No. 618



A Standard Full-Size Production Machine  
2" Precision Spindle • 4 Spindle Speeds • Wide  
Capacity • Oversize Design and Construction

**VIKING INDUSTRIES**  
220 MONTAGUE STREET  
ROCKFORD, ILLINOIS

**VIKING Hydraulic SPEED-MILL**

## Dependable MEASURING & CHECKING EQUIPMENT

*and Now*

HAND WHEELS, KNOBS, HANDLES

**Cadmium Plated**

Non-rusting — good looking

READY  
TO  
DELIVER



STRAIGHT and OFFSET TYPE



CAST IRON

SOLID  
MACHINE HANDLES



MALLEABLE IRON

We also build jigs, fixtures, special tools and  
machinery. Send us your blueprints.



**BOX PARALLELS**  
In 15 sizes, ranging from  
3 x 4 x 12 and up.



**UNIVERSAL ANGLES**  
In 10 sizes, ranging from  
4 x 3 1/4 x 5 and up.



**SLOTTED ANGLES**  
In 19 sizes, ranging from  
4 x 9 x 5 and up.



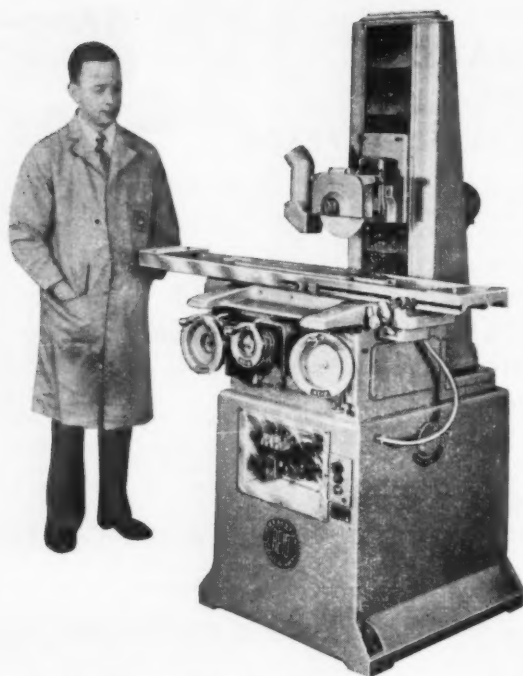
**SURFACE PLATES**  
Over 50 sizes, ranging from  
7 x 7 1/2 to 96 x 192.

Send for Complete Catalog

**MACHINE PRODUCTS CORPORATION**

6771 E. McNICHOLS ROAD

DETROIT 12, MICHIGAN



## REID SURFACE GRINDER MODEL 618V

WITH VARIABLE TABLE SPEED - 12 to 35 Feet Per Minute

REID BROTHERS COMPANY, INC.  
BEVERLY - MASSACHUSETTS

### Oven controls electrode moisture within .2%

Protection against moisture absorption is promised users of mineral-coated electrodes by the Philip Roden Co., 1721 E. Lake Bluff Blvd., Milwaukee 11, Wis., manufacturers of the newly announced DryRod Electrode Oven. It is claimed the oven fills the gap between unpackaging of manufacturer's sealed containers and the actual use of the electrodes in the welding line.

The DryRod Electrode Oven is a portable heated storage unit which provides control over the moisture content and temperature of electrodes at their point of use, and makes possible a system of electrode control, assuring better quality welds.

According to the manufacturer, the DryRod will accurately control the moisture to within .2%, the normal accepted U. S. Government standard for



**PREVENT ACCIDENTS**  
 ...use the **RIGHT TOOL**  
 for the job!



*a BILLINGS  
 will do it  
 better!*



\*VITALLOY®  
 SOCKET SETS & PARTS

Ask your BILLINGS DISTRIBUTOR he'll tell you why!

**THE BILLINGS & SPENCER CO. HARTFORD 1, CONN., U.S.A.**  
*Specialists in Drop Forgings Since 1869*

moisture content. The oven is basically a cylindrical, compartmented sheet metal unit which is heated by an 840 watt element operating off 110 or 220 volt circuits. Fully insulated, it has a low heat loss which adds to its efficiency. A variable thermostat gives close control on temperatures up to 600° F. Dimensions are 22" o.d. by 25½" long, with a capacity of 350 lbs. of electrodes up to 18" in length.

#### **Bench-type combination miller-grinder**

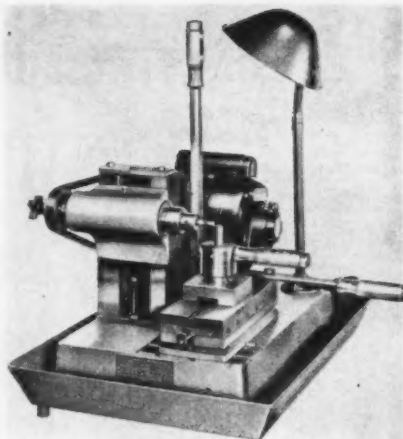
A bench-type production machine which can be set up for turning, milling or grinding through simple tooling changes, has recently been introduced by Viking Industries, Dept. A, 220 Montague St., Rockford, Ill. Designated as Model LMG-3, it features a common base, power unit, spindle, and vertical and horizontal slides to which special tooling and fixtures are added for the

desired type of lathe, milling or grinding operations.

A complete set of tooling is available for conversion, or the machine may be furnished as a single-purpose unit, in situations where production-line operation of several machines in "battery" formation is required. All attachments are engineered to operate with standard tools. A coolant system for the machine is optional.

Spindle speeds for the Model LMG-3 with standard pulleys are 825 and 3450 r.p.m.; an additional range of speeds from 100 to 7000 r.p.m. is optional. The 1" spindle with No. 7 Brown & Sharpe taper hole is mounted in heavy ball bearings. The through hole is 13/32" in diameter. The spindle is adjustable vertically with a maximum 7" distance from the centerline to the work table surface.

A standard type 1/3 h.p., 1725 r.p.m. motor drives the spindle through a conventional v-belt and pulleys, and



operates on 60 cycle dual voltage 115/230 frequency. The overall bench space required is 11"x18"; table working surfaces of 6"x9½" is provided.

## **SAMSON** Offset BORING CHUCKS

**THESE JOB-PROVEN FEATURES WILL  
SAVE YOU TIME AND MONEY**

- Quick tool change
- Positive dead-centering
- Precision offset adjustment
- Rugged tool support
- Safety round contour

**Complete Boring Chuck  
Accessories Available**

**WRITE FOR COMPLETE DETAILS**



**FAMOUS  
LAST WORD  
WHEEL  
DRESSER**



**LAST WORD SALES CO. • 18500 Mt. Elliott • Detroit 34, Mich.**

# NEW SURPLUS MACHINE SHOP TOOLS AT BARGAIN PRICES

## ROTARY FILES SET 3T

7 different pcs.  
High speed  $\frac{1}{4}$ "  
Shanks. (Com-  
plete Set for Less Than  
Cost of 1  
Rotary File).... **\$4.49**



**SET 22T - 14 Different pcs. \$8.79**  
as above

**NOTE:** We have on hand approximately 5,000 of the  $\frac{1}{4}$ " and  $\frac{3}{8}$ " dia. ball type rotary files with  $\frac{1}{4}$ " shanks. Either size, \$6.00 per doz.  
Further discounts on large quantities.



**Semi-High Speed  
Combination Drill and Countersinks  
60° angle of countersink.**

Size	Drill Size	Body	Each
C2	1/16	13/64	\$0.49
E1	3/32	3/10	.49
F1	5/32	7/16	.69
F2	3/16	7/16	.69

5% discount for purchase of 1 doz. of any size or mixture of above.



## HIGH SPEED STRAIGHT FLUTE HAND EXPANSION REAMERS

NEW reamers now in stock. Size B-17/32 to 19/32, D-21/32 to 23/32, E-23/32 to 25/32. Mfg. by Cleveland Twist Drill. Price on any one of above **\$3.25** ea.  
Three sizes—only

## HIGH-SPEED REX CUT-OFF BLADES

$\frac{1}{2}$ " x $\frac{3}{4}$ " x 6	\$1.24 ea.
$\frac{1}{2}$ " x $\frac{7}{8}$ " x 6	1.24 ea.
$\frac{3}{16}$ " x $1\frac{1}{2}$ " x $6\frac{1}{2}$ "	1.34 ea.
$\frac{3}{16}$ " x 1" x 8	1.34 ea.
$\frac{3}{16}$ " x $1\frac{1}{2}$ " x 8	1.34 ea.
$\frac{1}{4}$ " x $1\frac{1}{4}$ " x 7	1.34 ea.
$\frac{1}{4}$ " x $1\frac{1}{2}$ " x 10	1.50 ea.

Discounts on Quantities

## CARBIDE TIP MASONRY DRILL

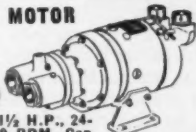
Carbide tip goes through any masonry. Set of 3 bits containing one 7/32"; three 1/4" and one 5/16". all five, **\$2.49**  
Value, only



**FILE MIX:** Set of 12 different files, lengths 6, 8, 10, 12 in. — half rounds, bastards, knife, mills, etc. First line, E-3 Nichols, Heller and other brands **\$3.49**

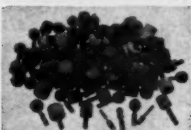
## PUMP AND MOTOR

Pump has 1" connections, built-in relief valve, adjustable up to 1500 lbs. Max. capacity 6 GPM.  $\frac{1}{2}$ " H.P., 24-volt motor, 4000 RPM. Can be used on 12 or 36 volts. 500 units available at quantity discounts. **CLOSE OUT AT \$9.98**  
F.O.B. Tulsa



## MOUNTED STONES

100 stones  $\frac{1}{4}$ " and  $\frac{3}{16}$ " shanks, rounds, points, cylinder shapes, etc. **\$8.98**  
These 100 pieces, only

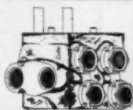


## 90° HEAVY DUTY GEAR BOX

Ball-bearing throughout with  $\frac{1}{2}$ " drive spline. 1:1 gear ratio which can be changed by different size pulleys or gears. Wt.  $\frac{3}{4}$  lbs. Length 11". Beveled gears. Excellent for hot rods, power mowers, etc., Only **\$5.95**



**10 to 1 GEAR BOX:** Throw-out type clutch, ball-bearing throughout,  $\frac{1}{2}$ " drive spline,  $\frac{3}{4}$ " output gear, rated up to 6 H.P. **\$6.49**



## MASTER HYDRAULIC CONTROL VALVE

For controlling two single or double action cylinders separately or simultaneously. Valve is close center type. 1500 PSI rating. **\$9.98**  
Only

## LARGE VOLUME RELIEF VALVE

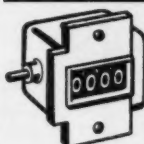
$\frac{1}{2}$ " pipe ports, range 1000—1575 PSI. Included with above valve only, at **\$2.49**

## P1A PESCO PUMP

Gear type, displacement  $1\frac{1}{4}$  GPM at 1500 PSI. Continuous operating speed, 3,750 RPM. Pump is driven by  $\frac{1}{2}$ " spline. **\$9.49**  
Dis. on Quan.



Control Valve, Relief Valve, P1A Pesco Pump as above, all for only **\$18.95**



## VEEDER-ROOT COUNTER

3 Digit clockwise rotation type, **\$1.49**

4 Digit clockwise rotation type, **\$1.89**

## TAP HANDLE

No. 6 (5/32" to  $\frac{1}{4}$ ") **\$3.19**  
Cap. Only  
Discount on Quantity

## OXYGEN OR AIR TANK WITH REGULATOR

Volume 104 cu. in. Maximum pressure Capacity 500 lbs. Complete with regulator assembly, 500 lb. pres. ga; belt clamp excellent for breathing apparatus; **\$3.95**  
compressors; small welders, etc.



## ELECTRIC MOTOR BARGAINS

1/6 H.P., 24-volt D.C. or A.C., 8.4 amp. ball-bearing throughout, 5,000 RPM clock-wise direction—10,000 RPM counter-clock-wise direction **\$4.98**

$\frac{1}{4}$ " H.P., 24-volt A.C. or D.C., 22-amp, mfg. by Delco, 6,000 RPM,  $\frac{3}{8}$ " shaft, adaptable to 12 or 36 volts. Only **\$4.95**

2 H.P., 90-amp, 4,000 RPM, 24-volt, ball-bearing throughout, double shaft, adaptable to 12 or 33 volts. Weight 18 lbs. F.O.B. Tulsa **\$7.95**

**INTERNAL GRINDING WHEEL MIX:** 100 wheels,  $\frac{1}{4}$ " arbor, various grits and dimensions **\$9.95**  
Post Paid

**GRINDING WHEEL MIX:** 30 grinding wheels with  $\frac{1}{4}$ " arbors, up to 3" in dia., plus mandrel, only **\$3.29**

**MONEY-BACK GUARANTEE—All merchandise brand new—all orders (except those specified F.O.B. Tulsa) are shipped post paid, saving you up to 25% on total delivered cost. Write for free catalog describing thousands of bargain cutting tools.**

# T & T TOOL

221 W. SECOND  
TULSA, OKLA.

*Faster*

## SPINDLE ALIGNMENT



On tapping and reaming jobs, the Ziegler Floating Tool Holder speeds the making of set-ups because it automatically compensates for alignment inaccuracies, even though they amount to as much as 1/32" radius or 1/16" diameter.

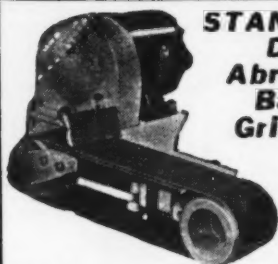
The man-hours a Ziegler Holder saves will pay for it several times over in a short time.

W. M. ZIEGLER TOOL CO.  
13570 Auburn, Detroit 23, Mich.

*Ziegler*  
ROLLER  
DRIVE

WRITE FOR  
CATALOG

**FLOATING HOLDER**  
for Taps and Reamers...



## STANDARD D-4 Abrasive Band Grinder

Famous  
for  
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW  
MANUAL ON FINISHING—WRITE TODAY

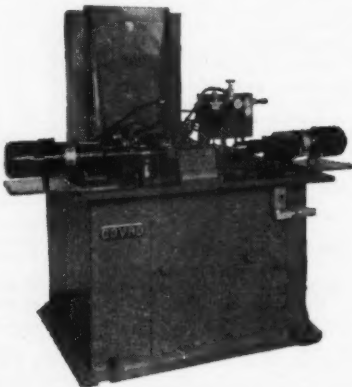
**WALLS SALES CORP.**

333 Nassau Avenue, Brooklyn 22, N.Y.

## Machine taps four radial holes at once

A new type of machine for speeding up the tapping of radial holes has recently been announced by the Govro-Nelson Co., 1933 Antoinette Ave., Detroit 8, Mich. The set-up illustrated below incorporates four Govro-Nelson Model ST Tapping Units, and was designed for tapping four 5/16-18 holes in a mild steel bracket. By varying the number and positions of the units, the machine can be adapted to other tapping operations.

The operator loads the machine



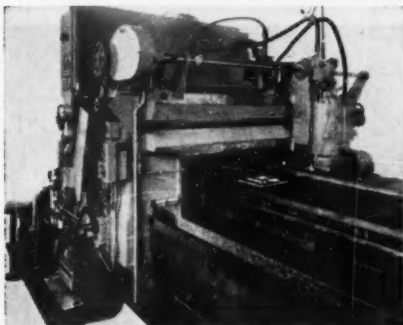
manually, touches the start switch, and the part is automatically clamped by means of an air cylinder. Thereupon, the four units automatically tap the four holes simultaneously. Upon completion of the tapping, the part is automatically unclamped. Output is at the rate of approximately 480 pieces per hour.

## Onsrud automatic power feed router and skin mill

Onsrud Machine Works, Inc., 3900 W. Palmer St., Chicago 47, Ill., has introduced the Onsrud InvoMill, an automatic, electronic-controlled power feed router and skin mill.

The InvoMill permits routing of thicker stocks of aluminum and other non-ferrous metals than heretofore possible with standard hand feed routers, according to the manufacturers. It is of particular importance in the making

of grids which hold gas tanks and other parts inside aircraft wings. Grids eliminate complicated internal bracing and fabricating, speeding up production.




A 30 h.p. motor supplies power for routing aluminum stock of 1" or more

in thickness. This work capacity is especially interesting to aircraft manufacturers in view of the trend by aircraft designers to thicker stock for greater structural strength, wider latitude for design improvements, more economical assemblies, etc.

The Onsrud InvoMill also handles skin milling of large aluminum pieces used to form wings. A 40 h.p., 5400 r.p.m. direct-driven, liquid cooled motor, mounted on the cross rail, provides all the power necessary for tough milling work. Both motor and cross rail may be tilted to varying degrees, providing a combination of angles without the use of sine plates.

Three table widths, 72", 84", and 96", are available for routing or skin mill applications, with bed lengths furnished in multiples of 15 foot sections plus 7 feet for the conveyor.



**EFFICIENT — LOW COST  
PRODUCTION**

MEANS

**ROUSSELLE**

**PUNCH  
PRESSES**

WRITE FOR  
DETAILS

**O.B.I. PRESS**

**HORN PRESS**

**DEEP THROAT**

**SERVICE MACHINE COMPANY**

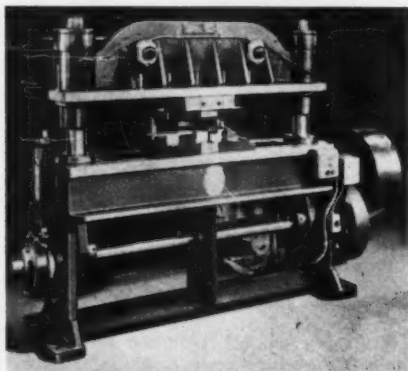
**7627-33  
S. Ashland Ave.  
Chicago 20**

### Wales twin column punch press

Twin Column Punch Presses have just been announced by the Wales-Strippit Corporation, 345 Payne Ave., North Tonawanda, N. Y. These presses may be used for all types of blanking, forming, drawing, and bending. Due to the similarity of design between Wales Twin Column Punch Presses and a standard die set, these presses, in some cases, eliminate the necessity of die sets. The illustration below shows a typical conventional die set up in a Wales Twin Column Press.

A cylindrical pair of precision ground and polished ram guides, 4" in diameter, is positioned vertically at 90° reducing possible wear to a minimum. The actuating mechanism of the ram operates inside the vertical ram posts. Scraped guide sleeves move up and down on the ram guides. These sleeves are individually fitted, and held to a .00025" tolerance. Long press life and exact alignment is assured by heavy-duty liners in the sleeves which are fully enclosed

by a two-way seal that eliminates dirt and chips by wiping the ram posts clean. The other side of the two-way seal retains a half pint of oil for positive lubrication.



A rapid action 4-point clutch with a sliding clutch dog of alloy steel provides rapid action for high speed production. The square dog engages the



**FOR FASTER PRODUCTION!**

THE *unusual*  
**ELLIS**  
DIVIDING HEAD

"Versatile" is the word for the unusual Ellis Dividing Head. This beautifully designed and built unit can extend the profit and production possibilities of your mills, grinders, drill presses and jig borers. It has 6½" swing, or 11" swing when used with riser blocks. Its fully universal action provides every needed setting, so that most work can be completed without rehandling. Work may be held between centers, or in chucks or collets. Write for catalog giving complete details!

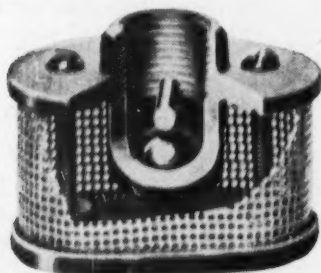
**NICHOLS-MORRIS CORPORATION** 50-G CHURCH STREET  
NEW YORK 7, N. Y.

bull gear in any one of the four positions located in the bull gear. Immediate engagement results as the dog slips into the driving pin recess located at each quarter of the revolving bull gear. Driving pins are heat treated and hardened. Herringbone bull gear and pinion gears provide smooth operation due to precision tooth spacing and the maximum number of teeth continuously in mesh. Overlapping of teeth provides evenly distributed pressure over large area of teeth surface for long life operation.

Extra large bearing areas on the crankshaft distribute pressures and loads which result in minimum wear and minimum friction loss for efficient and accurate operation. These heat treated, precision ground crankshafts are made from one-piece chrome moly steel bars.

#### Combination strainer and check valve

An ingenious new combination strainer and check valve for use on all kinds of circulating pumps has been placed on the market by Leominster Tool Co., 262 Whitney St., Leominster, Mass. According to the manufacturer, this device makes worn-out pumps stay primed and prolongs their life; it keeps all pumps primed, ready to start at once, thus saving considerable operator time.



This new unit, called the Roper Combination Strainer and Check Valve, is guaranteed as to workmanship and performance. The valve is placed at the bottom of the suction pipe where the pressure on the valve is the greatest, thus assuring positive action. The strainer comes apart from the top, so

## WESTLEN REELS

*Adjustable  
Self Centering*

For feeding strip and wire coil stock to presses. Coil capacity 300 to 500 lbs. Outside ring dia., 28" to 36". Height of reel, 36". Wheel automatically adjusts parts to suit inside diameter of coils from 11" to 20". Arm allows for quick conversion to horizontal or vertical position and adjusts height of reel.

SEND FOR LITERATURE



**The RULETA Co.**  
27 WARREN ST. NEW YORK 7

## CLEAR

### NAMEPLATE MARKING

MODEL  
No. 4



The nameplate on your product is your signature; keeps it neat and legible! Accurate location and alignment are assured

with this  
**NAMEPLATE  
DETAIL PRESS**

- Simple Operation
- Perfect Alignment
- Uniform Depth

**GEO. T. SCHMIDT, INC.**



1804 W. BELLE PLAINE AVE.  
CHICAGO - 13 - ILLINOIS

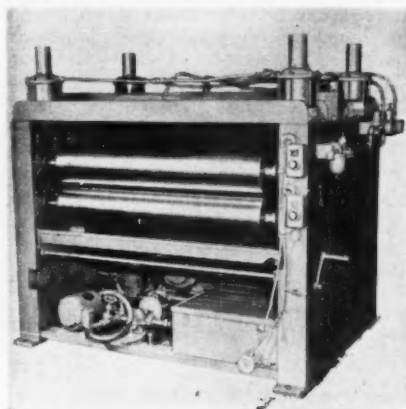
that no pipes need be taken down, and no pipe joints dismantled, should the strainer need to be taken off for cleaning. This unit is available in two sizes, the No. 2, made in  $\frac{1}{4}$ ",  $\frac{3}{8}$ " and  $\frac{1}{2}$ " pipe sizes, and the No. 3, made in  $\frac{3}{4}$ " and 1" pipe sizes. It has been adopted as standard equipment by many large manufacturing plants.

### Metal roller coating machines

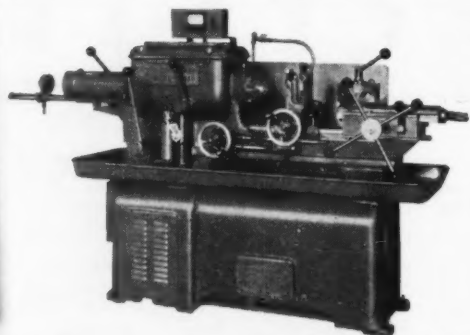
The Union Tool Corporation, Warsaw, Indiana, reports increasing sales of Union Roller Coaters to some of the country's larger plants. The function of the Union Roller Coater is to apply drawing compounds uniformly to sheet steel prior to the drawing operation. The machine shown below is equipped with three pairs of rolls. The first pair is of hardened steel and is used for deburring the stock. The second pair is neoprene-covered and is used for actual application of the compound. The third set of rolls is of hardened steel and is used primarily as squeegee rolls for wiping off excess compound and for forcing

the remaining compound into the pores of the metal.

The machine is equipped with a circulating pumping unit to feed the coat-



ing rolls. Models are built in sizes to fit any stock up to 96". The operating factors of this machine are claimed to



**Plain or Back-Geared** — Forged steel spindle with anti-friction precision bearings, friction clutch and brake. Spindle nose,  $2\frac{3}{8}$ "-8.

*Write today for complete details.*

## SIMMONS MACHINE TOOL CORP.

1725 North Broadway, Albany 1, N. Y.

New York Offices: 50 East 42nd Street

## HERE IT IS!

The new Simmons No. 2 Turret Lathe, offered to you with three distinct advantages:

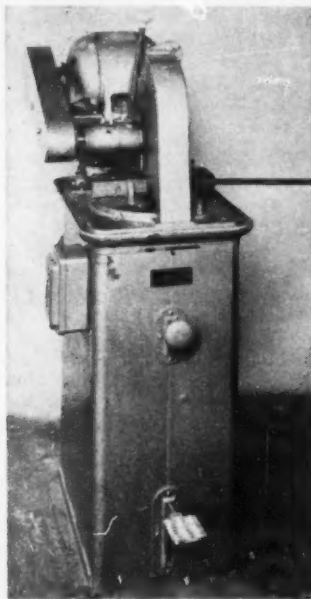
- Low Cost
- High Precision
- Early Delivery

$1\frac{1}{4}$ " bar capacity . . . 14" swing over ways. Micro-Speed Drive offers infinite speeds—plain, 375 to 1500 RPM; back-gear, 44 to 750 RPM—for bar or chucking work. Power feed to turret.

result in such economies as increased die life due to the uniformity of application, reduction of rejects and a substantial increase in production at lower cost.

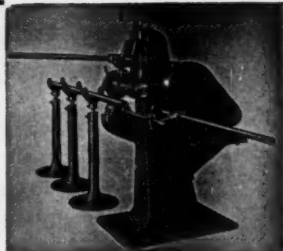
### Wet and dry cut-off machine

The new "Catskill" abrasive-type cut-off machine has been introduced by the Joseph E. Murphy Co., 24 Ellsworth St., Worcester 3, Mass. This new unit serves a double purpose—for use where fast cutting is necessary on hard steel, such as bars, tubes and structural shapes—and for cutting of all non-ferrous metals and plastics, with the wet cutting attachment fully enclosed.



The new machine is powered by a 3 h.p. motor with a 10" wheel mounted on a swinging arbor 45° in either direction. The arbor is 1" alloy steel mounted on pre-loaded bearings, sealed on the outside and provided with adjustable take-up.

The capacity of the Model D-2 Catskill wet and dry cut-off machine is 1½" diameter in solid materials; shapes and tubings up to 2" may be cut.



## Faster TUBE & PIPE CUTTING

Steen High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters ½" to 3"; ½" to 6"; 3" to 12".

WRITE FOR CIRCULAR TODAY

**Continental Machine Co.**

1954 Maud Ave. Chicago 14, ILL.

## HAND TAPPING with MACHINE PRECISION

Adapts for  
LATHE  
USE

**59<sup>50</sup>**

F. O. B.  
ST. PAUL



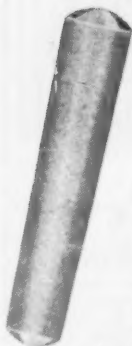
Just slip a tap adapter into the Dahlstrom Tap Guide and twist. Your hand tapping will be quick and accurate. For machine tapping, the spindle tap is center-bored to fit the tail stock center of a lathe. Size 13" x 8" x 14". Includes 9 adapters (8/32 to ¼"). Taps not furnished. Dahlstrom Mfg. Co., 2586 W. Carpenter, St. Paul 8, Minn.

WRITE FOR PAMPHLET.

**Dahlstrom TAP GUIDE**

**SPECIFY**

**STANDARD**



## ← **TAPER PINS**

ALSO FOR

- MACHINE RACKS
- WOODRUFF KEYS
- MACHINE KEYS

STANDARD TAPER PINS are milled from carefully selected bar stock to extremely close tolerances . . . straight to taper. The uniformity and accuracy of STANDARD TAPER PINS will save time on assembly . . . will assure you of trouble-free service. Available in STANDARD steel . . . also in stainless steel and brass. Specify STANDARD TAPER PINS and other STANDARD products.

SEND TODAY FOR CATALOG

**STANDARD STEEL SPECIALTY  
COMPANY**

BEAVER FALLS

PENNSYLVANIA

## **HIGH SPEED KNURLS**

WE STOCK ALL SIZES REED KNURLS IN STRAIGHT, DIAGONAL AND DIAMOND PATTERNS FOR BOTH LATHE AND SCREW MACHINE HOLDERS.

## **DRILL JIG BUSHINGS**

LARGE NEW YORK STOCK FOR AMERICAN DRILL JIG BUSHING CO. WE CARRY THOUSANDS OF HEADLESS PRESS FIT, SLIP RENEWABLE, LINERS, AND HEAD PRESS FIT BUSHINGS.

GOOD DELIVERY FOR SPECIAL SIZES.

## **SID TOOL COMPANY, INC.**

126 LAFAYETTE ST., NEW YORK 13, N.Y.  
BEEKMAN 3-4270 - 1-2-3

**ONE OF THE LARGEST CUTTING  
TOOL DEALERS IN THE EAST.**

## **Portman optical comparator**

The "Century" Optical Comparator (Model C-100) is a new instrument stated to incorporate several unique mechanical and optical features. It is a recent development of Portman Instrument Co., 6 Manhasset Ave., Port Washington, N.Y.



The "Super-Light" condenser lens unit, which is power cooled, is said to provide exceptional screen definition. When used with color filters, the intensity and shading of light may be varied. This new unit also offers the advantages of a new stage design. This new staging assembly provides large working space, and includes a so-called swing feature, permitting the entire stage and work piece to be moved completely to one side, facilitating the change-over of lens units without disturbing work setups. The stage assembly is adjustable by means of built-in controls for helix angle positioning, and the entire stage may be removed, permitting special production type fixtures to be mounted directly to the stage carrier base.

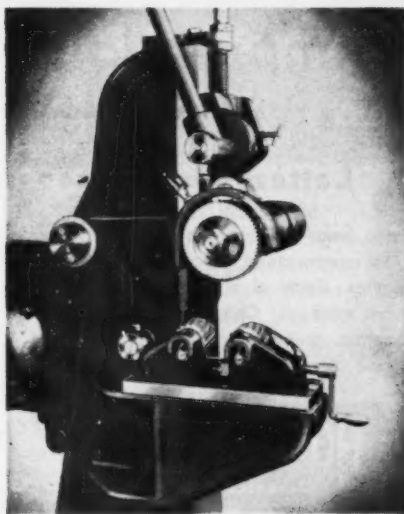
The new "Ciptar-Scope" optical system has been designed to complement the large mechanical capacity of this new comparator. The special "Ciptar"

lens provide remarkable long focal lengths, maximum light, large objective areas and sharp definition. Focal lengths average in excess of three inches. In addition, the screen image is oriented with respect to the position and movement of the projected part. Magnifications of 10X, 20X, 25X, 31¼X, 50X, 62½X, and 100X are obtainable as standard equipment.

A 16" x 20" sight-line screen and frame is provided, permitting the use of drafting instruments and vernier protractors for direct tracing and measurement of projected images from a straight edge guide bar. The chassis-type construction of the new "Century" comparator assures permanent alignment of all mechanical and optical components. Overall dimensions are: height 64", width 23" and depth 35".

#### **Pipe and tube de-scaling and cleaning attachment**

A new pipe and tube De-Scaling and Cleaning Attachment for Steen Cut-Off Machines is announced by Continental Machine Co., 1954 Maud Ave., Chicago 14, Ill.



This device is stated to be able to clean rust, scale, paint, and other deposits off pipes, posts and building

## **FOR PRECISION IT'S HAYFRED'S DIAMOND TOOLS**

**ALL TYPES MADE TO SPECIFICATIONS**

- ★ **WHEEL DRESSERS**  
*Single Point*  
*Single Layer Cluster*
- ★ **RADIUS FORMING TOOLS**
- ★ **THREAD GRINDERS**
- ★ **VALVE GRINDERS**
- ★ **GEAR GRINDERS**
- ★ **HARDNESS TESTERS**
- ★ **CONTACT POINTS**
- ★ **SHAPE TOOLS**
- ★ **SCRIBING TOOLS**
- ★ **GLASS CUTTERS**
- ★ **TUNGSTEN CARBIDE MATRIX**

Send for folder showing complete line...

*"Several territories available..."*



# **HAYFRED CO.**

**91 BROADWAY, SPRINGFIELD, MASS.**

**OGINZ & HERRING**  
and **DEWAR GLOVE CO., Subsidiaries**

columns. Sizes are available for cleaning pipes up to 12" in diameter. It is especially adapted for reclaiming used pipes and tubes.

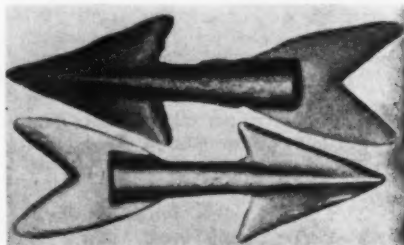
Most work requires only one pass through the rollers to remove all deposits completely. The attachment feeds up to 20 feet of pipe per minute, making it suitable for both production work and intermittent use.

### Compound for tumbling barrel finishing

A special purpose chemical for barrel finishing brass, bronze, copper, gold and silver stampings, castings, machined and drawn parts is being introduced by Blue Magic Chemical Specialties Co., 2135 Margaret St., Philadelphia 24, Pa. It is offered under the trade name Blue Magic Compound No. 1 Double Strength. This compound is a highly concentrated paste for use in very small quantities and is said to yield uniform metallic colors, finished in extremely short time cycles.

Blue Magic No. 1 is recommended by the manufacturer for finishing either

with or without media, and with selected non-ferrous media for roughing, deburring, cleaning and finishing in a single operation. Recommended quantities are only 4 oz. of compound for finishing runs in a 32" x 30" tumbling barrel at high water level. As a cutting compound in deburring operations only one to two ounces of compound are required at low water level in the barrel.



Principal advantages claimed are economy, fine finish, uniform metallic colors and greatly reduced time cycles on all operations.

## Make A Clean Impression!

### Hand-Cut STEEL STAMPS

#### Letters & Figures



Deep, hand-cut letters in special-formula steel assure clean impressions and long service. Face of stamp is angled for extra strength. Chamfered corners for locating the base. Ask for Hoggson Brand at mill supply houses.



**HOGGSON & PETTIS MFG. CO., 141-H BREWERY STREET  
NEW HAVEN, CONN.**

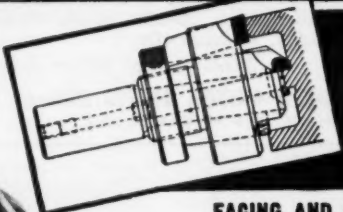
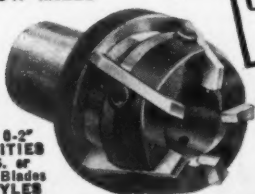
# GENESEE

## COST CUTTING MULTIPLE OPERATION TOOLS

**HOLLOW MILLS - UNDER-  
CUTS - FACES - CHAMFERS  
BORES AND SPOT DRILLS**

**ADJUSTABLE  
HOLLOW MILLS**

STD. 8-2"  
CAPACITIES  
H.S.S. or  
T.C.T. Blades  
18 STYLES



**FACING AND COUNTERBORING TOOLS**

STD. 1 1/4" to 4"  
DIAMETERS  
INTERCHANGEABLE  
PILOTS H.S.S. or  
T.C.T. BLADES



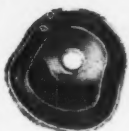
Your production tool problems are our problems. That's the reason many manufacturers turn to our engineering department for confidential assistance. Experience gained from more than 40 years of "know how" is yours for the asking. Write today for Catalog 48-H.

- ADJUSTABLE HOLLOW MILLS
- FACING AND COUNTERBORING TOOLS
- SPECIAL PRODUCTION TOOLS

**GENESEE MFG. CO., INC.**  
566 HOLLENBECK ST.  
ROCHESTER 4, NEW YORK

# EISLER CAM

**JIG** BORING • MILLING



**A SPECIALIZED  
ROWBOTTOM CAM  
MILLING SERVICE...**  
JIG BORING ... SPOT  
WELDING ... CON-  
TRACT PRODUCTION  
... EXPERIMENTAL  
DEVELOPMENT

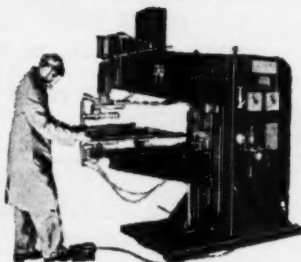


• Consultation without any obligation on your part is cordially invited

## RESISTANCE WELDERS

SPOT • BUTT • GUN • SEAM

For all types of welding in sizes: 1/4 to 300 KVA. Foot, air or motor operated.



*We invite contract spot or butt welding in large or small quantities.*

**EISLER ENGINEERING CO., INC.**  
762 South 13th St., (Near Avon Ave.)

Chas. Eisler, Pres.  
Newark 3, N. J.



## Put the "PUNCH" in Punch Presses with a MODERN Motor Drive

No need to use slow speed or geared motors and small pulleys to slow down your presses.

Utilize standard 1750 RPM motors.

"V" Belt Drive absorbs shock. Operate smoothly, silently, efficiently, economically.

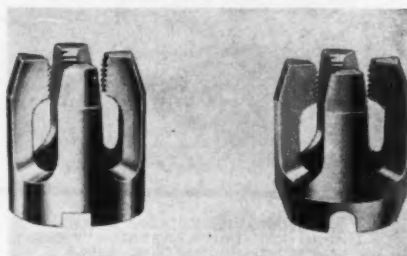
Write to Dept. BB for complete details.

**MODERN MOTOR DRIVES DIV. of The Nichols Eng. Co.**  
Dept. BB, 3818 W. GRAND AVE. CHICAGO 51, ILL.

## P & W introduces new screw machine dies

P & W Monocone Dies and Die Holders for screw machines and other equipment are now being produced by Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford 1, Conn., as companion products to the Duocone line of dies and holders. The introduction of the Monocone tools provides users with a choice of the two popular types of concentric-adjustment dies — flat-backed and cone-backed. The dies may be obtained in screw gage sizes 0 through 14 and in fractional sizes from 1/16" through 1 1/8".

The Monocone Dies illustrated, are conical at the nose end only. The flat



base is driven by lugs, and is centralized in the holder by tightening the adjusting cap. The Duocone Die is tapered at both ends and is aligned by both the adjusting cap and a conical seat in the holder. It is driven by dowels

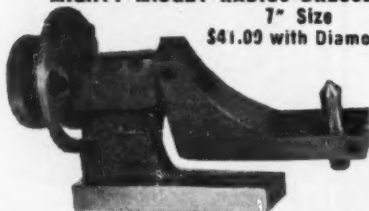
## THE "MIGHTY MIDGET" LINE

ORDER DIRECT on 10 day Money Back Guarantee

### MIGHTY MIDGET RADIUS DRESSER

7" Size

\$41.00 with Diamond



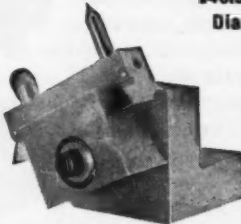
Hardened Shaft, Bearing Adjustable for Wear. Accurate, Adjustable 180° Steps. Diamond always Clamped Perfectly in Center.

10" Wheel Size for Norton Co. All \$46.00 with Diamond

Special 14" Size \$89.00 less Diamond

### MIGHTY MIDGET ANGLE DRESSER

\$46.00 with Diamond



First low cost high precision Angle Dresser on the market. Can be set very accurately with a protractor. Works underneath the wheel. Large bearing surfaces.

Ball Thrust Bearing. Heat Treated Cast Iron. Guaranteed Accurate.

Please give DD number when possible.

**SPERMAN METAL SPECIALTIES • 2199 E. 21st ST., BROOKLYN 29, N. Y.**

which engage corresponding notches in the die. Both dies are otherwise similar in construction. They are made of either high speed or carbon steel as required, and are heat treated to obtain the best combination of hardness and toughness for long life.

When the threads of these dies are cut in a die blank, the die is held in a master holder which simulates the conditions under which the die will later be used. This insures a thread that will be free from distortion and taper when it is closed down to size. Both dies are adjusted by compression radially toward the axis, insuring concentricity.

Holders for both types of dies are produced in both reversing and releasing types. The reversing holders are designed for use on automatic screw machines and other machines which have position reversal with a minimum lag. Releasing holders are made for such

applications as hand screw machines, where the reversing operation is dependent upon the operator.

### Severance recommends carbide tool conservation

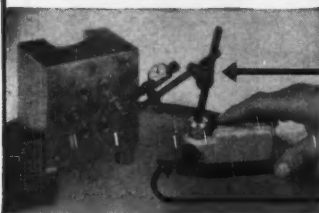
Due to the heavy demand for Carbide products running in excess of available supply, Severance Tool Industries Inc., 722 Iowa St., Saginaw, Mich., has sent out a letter to those firms interested in Carbide tooling in either defense or civilian production, relative to the conservation of such Carbide tools as midget mills, burs, and countersinks, through the use of their regrinding and repairing service.

Severance states that, dull, broken or discarded Carbide tools can be reworked by their Carbide specialists so as to give new tool performance. Also, many times a new Carbide tool, for which there is no current need, can be reworked into a tool to meet a present urgent requirement.

## HEAVY DUTY "MITI-MITE" NO. 150

The new, amazing magnetic base holder for mounting Test Indicators to flat or curved surfaces INSTANTLY!

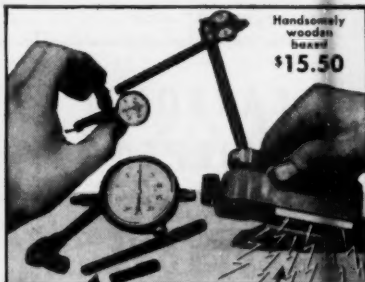
NO MORE CUMBERSOME  
HAPHAZARD CLAMPING



Shows MITI-MITE being used as surface gage.

Ball and socket swivel construction permits precision adjustment.

Fingertip control for operating magnetic release.



Handsomely  
wooden  
boxed  
\$15.50

Complete accessories included for taking all indicators up to 3" dia.

Magnetic pull, approx. 100 lbs.  
Size of base, 1 1/2" x 4".

#### OTHER "MITI-MITE" UNITS

No. 100	Magnetic base Holder for smaller test indicators.	\$7.50
No. 120	Combination Test Indicator magnetic base holder and double lens 4X Magnifier.	12.00
No. 200	Magnetic Base Hand-Lite complete with 25 and 40 watt bulbs.	8.50
No. 300	Combination of No. 100 and No. 200.	15.50

SEND FOR BULLETINS No. 602 and 603

**ENCO Manufacturing Company, DEPT. 2121**  
4524 W. Fullerton Ave., Chicago 39, Ill.

Order from your mill supply dealer or send order with name of your mill supply dealer

### Anti-skid grating has great strength

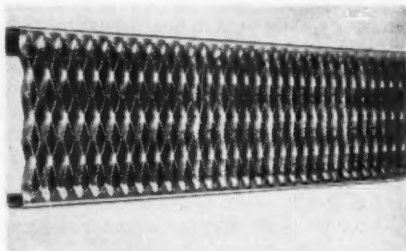
The Globe Company, 4000 S. Princeton Ave., Chicago, Ill., has announced its Grip-Strut Grating, for use wherever a non-skid grating surface is required. Several years of development and testing at the Globe plant and at Pittsburgh Testing Laboratories have produced this versatile material.

The grating appears as a diamond-shaped pattern in which the percentage of open area is in excess of 75% of the total reticulated surface. The struts or vertical members are joined by integral saddles to create lateral struts of great strength. The material used for the manufacture is sheet steel or aluminum, of gauges ranging from 12 to 16.

Metal for forming into longitudinal channels, step risers, step nosing or mouldings is integral with the grated surface, eliminating the need for welding in many applications.

Laboratory tests have revealed that in sections 20" wide and 48" long, Grip-Strut withstood over 100,000 one-inch

oscillations without any damage. No separation of the struts occurred nor did it lose any of its original form or strength. No welding or peening operations occur in the manufacture of Grip-Strut. It is all one piece of material.



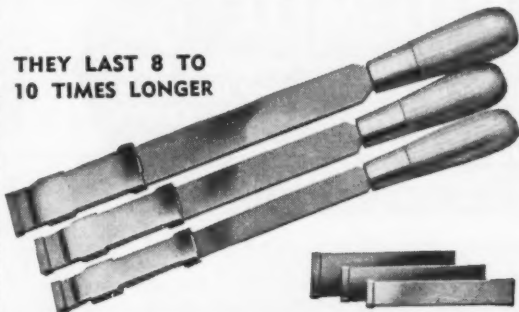
Great strength coupled with light weight recommends Grip-Strut for a variety of applications. In usages such as cat walks, work platforms, steps, etc., its anti-skid features are also of importance along with the fact that its structure makes possible easy cleaning.

## CARBOLOY TIPPED SCRAPER BLADES

Available in  
three widths



THEY LAST 8 TO  
10 TIMES LONGER



Especially good for hard alloy iron and extremely hard bronze castings. If you are using Anderson Hand Scrapers it is not necessary to buy complete new scrapers in order to use carboloy tipped blades. Simply remove high-speed blade and slip in the Anderson Carboloy Tipped Blade.

Write for Bulletin No. 12-5

**ANDERSON BROS. MFG. CO., Rockford, Ill.**

Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

**Nicholson Expanding Mandrels**  
**SAVE TIME LOST**  
**Providing Solid Arbors**

Records in many shops show Nicholson expanding mandrels actually get operations completed in less time than was formerly consumed in providing solid arbors. In cases this results in a tremendous cut in "down" time. Set of 14 Nicholson mandrels replaces

209 solid arbors; for all bores  $\frac{1}{2}$ " to 7". Sold singly or in sets.



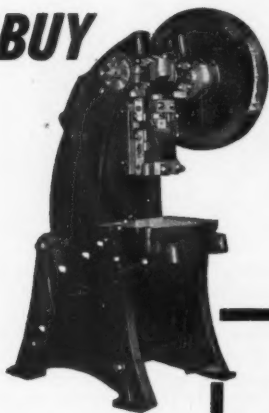
**W. H. NICHOLSON & CO.**

117 Oregon St., Wilkes-Barre, Pa.

**BULLETIN 750** shows how these widely used tools save time, promote precision

Steam & Air Traps • Control Valves • Expanding Mandrels • Arbor Presses • Welded Floats

**BUY**



**MARSHALLTOWN**

**FOR LONG LIFE  
 DEPENDABILITY  
 PERFORMANCE**

Write  
 Today  
 For  
 Literature

Engineered and built to give the utmost in dependable, trouble-free service. More die space—chrome molybdenum cranks, wrist pin connections and many other proven advantages.

**MARSHALLTOWN MFG. CO.**  
 900 E. NEVADA STREET  
 MARSHALLTOWN IOWA

# RIVETING?



## use LINLEY Noiseless Riveting Machines

Sturdy, fast, easily operated! Put your production rivet spinning jobs on Linley Riveting Machines and watch your costs come down.

We are glad to demonstrate the quality of work that can be turned out. Send us samples of your parts and you'll be impressed with what you can do and how little it will cost you. Sizes and types available for iron or cold rolled steel rivets up to  $\frac{3}{4}$ " with capacity for larger rivets of softer materials.

Send for descriptive bulletin R.

**LINLEY BROTHERS CO.**

673 State St. Ext. Bridgeport 1, Conn.

**Micro  
Supreme**

**LAY-OUT AND  
IDENTIFICATION DYE**

**13 COLORS**

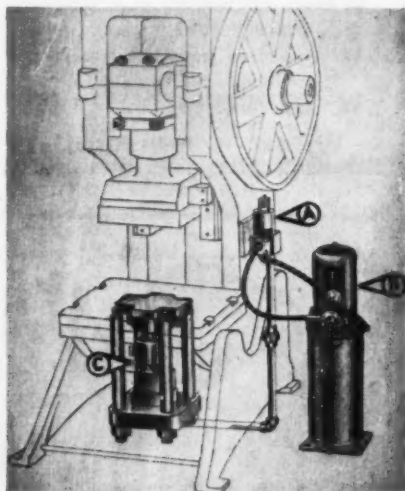
For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheet, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.

**MICHIGAN CHROME &  
CHEMICAL COMPANY**

6340 E. Jefferson Ave. • Detroit 7, Mich.

## Press bed jack prevents overloads

Dayton Rogers Manufacturing Co., 2824 13th Ave., South, Minneapolis 7, Minn., has introduced a useful safety device to avoid against press overloads. It is not only necessary to protect the power press from overload damage, but it is also advisable to assure the operator that a constant work pressure is produced at all times at the point of operation on the piece part being worked upon. This is particularly so on all precision forming operations, where the free position of the finished part has to be held to a high degree of accuracy.



The introduction of this new improved hydraulic Press Bed Jack can be fastened directly to the bolster plate or press bed frame, see Figure C in the illustration. Figure B is the hydro-pneumatic pumping means that can be operated directly off the average shop air line. The control valve, A, can be set at any desired tonnage, not only giving the press the desired overload protection, but also adjustable to give the tools being used the desired overload protection.

This hydraulic overload Press Bed Jack can be used to an advantage on

such operations as riveting, marking, stenciling, squeezing, assembling, forming, swaging, staking and similar operations. According to its manufacturer, this Press Bed Jack will definitely assure constant working pressure at all times at the point of operation, and will compensate for variation in the piece part material thickness.

### The Universal Stock Toter

Industrial Engineering & Manufacturing Co., Inc., Brimfield, Ind., introduces a new line of floor trucks known as the Universal Stock Toter. This is a sturdy, maneuverable shallow bed truck designed for such jobs as line stocking, machine stocking, moving work parts, or for conveying smaller parts in the stockroom or shipping department. It places the work at normal operating elevation.



The stock toter frame is made of  $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{3}{16}''$  angle iron. The container sides and bottom are of 12-gauge sheet metal. The unit can also be furnished with sides and bottom of 13-15 gage,  $\frac{3}{4}''$  mesh expanded metal. Caster equipment is two swivel-type casters at one end and two rigid type at the other. Either 4" or 5" casters are available made of semi-steel or fiber as desired.

Dimensions of the container are 30" x 24" x 10" deep. Height of the truck from floor to the top is 34 $\frac{1}{2}''$  with 4" casters (35" with 5" casters). A lower shelf attached to the frame just above the casters is available if desired.

## CUTTERS



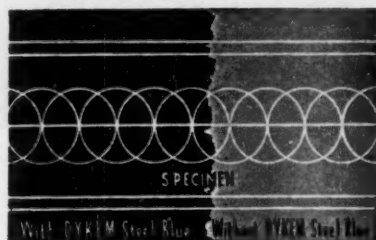
**FLAT BARS • RODS • ANGLES  
WIRE ROPE**

Hand Operated      Three Sizes

**SEND FOR CATALOG SHEETS**

**T. H. LEWTHWAITE MACHINE CO.**

312 East 47th Street New York 17, N. Y.



### DYKEM STEEL BLUE STOPS LOSSES making dies & templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

**THE DYKEM COMPANY**

2301G North 11th St., St. Louis, Mo.

## CARBIDE TOOL USERS

### Get these 6 training slide films

Improve worker skill, train new men faster. Cut waste, increase productivity, conserve cemented carbides, too.

Six clear, easy to understand 35-mm silent slide film strips featuring: 1—What is Cemented Carbide? 2—Designing Single Point Cemented Carbide Tools. 3—Brazing Cemented Carbide Tools. 4—Designing and Grinding Chip Breakers. 5—Grinding Single Point Cemented Carbide Tools. 6—Applications and Trouble Shooting.

They are training films (not advertising). Available at approximate print cost. Complete set \$15 (f.o.b. Detroit). Singly, \$2.50; specify title. Included with each order: Instructor's Manual plus booklets of films. Send today for your films or free descriptive folder, GT-223.

## CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11129 E. 8 Mile Street, Detroit 32, Michigan

### Standardize on

## hall COLLET CHUCKS

for  
SPEED,  
ACCURACY,  
ECONOMY



**Automatic adjustment speeds up production** in multiple operations with push-out type HALL COLLET CHUCKS. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments. All grip ...no slip. No bearings...no heat or lost power. Instant release without stopping lathe.

**SATISFACTION GUARANTEED!**

**Made in Two Sizes to Fit Your Requirements:**

Model A...1" (max. capacity 1-1/16")

Model B...2" (max. capacity 2-1/16")

Round, square or hexagon collets, plain or serrated

Write today for illustrated catalog and price list

**HALL MANUFACTURING COMPANY**

622 TULAKOSA DRIVE, DEPT. A, LOS ANGELES 26

Users say—"HALL IS BEST OF ALL"

## Hanson-Whitney dual thread comparator

As a companion instrument to its Standard Thread Comparator, Hanson-Whitney Company, Hartford 2, Conn., introduces the Dual Thread Comparator, intended to provide a more thorough visual inspection of externally threaded parts up to 1½" in diameter.



The design makes use of the same component parts as the Standard Comparator (See Machine and Tool Blue Book, Sept. 1950, p. 193), but in addition to the single jaw which checks assemble-ability by means of one composite reading of pitch diameter, lead and angle, there is a second jaw with a two-thread engagement which provides a specific check of pitch diameter, as well as a check of back taper on very short threads whose length does not exceed the major diameter of thread. This second check will also indicate presence of lead or angle errors. Both readings are taken visually on a single dial indicator. The Dual Thread Comparator may be used both for final acceptance gaging in the inspection department or for production checking parts at the machine.

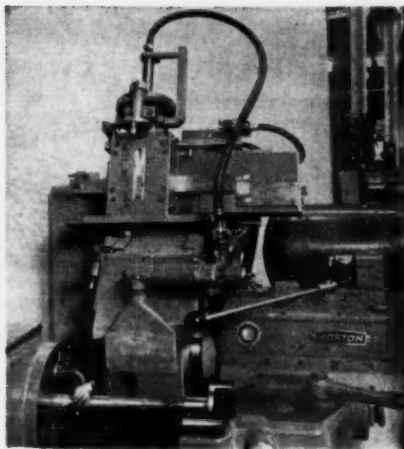
**MACHINE and TOOL BLUE BOOK**

### Grinding wheel truing device

Time and effort are saved with a new development which is available for all Cylindrical Grinding Machines made by Norton Company, Worcester 6, Mass.

The device automatically performs angular, step, straight or combination formed wheel face truing at the touch of a push button, thus eliminating the operating burden normally involved in performing these functions with non-automatic equipment. The diamond truing tool, which is located inside the wheel guard above the wheel, makes a round trip at a predetermined feed and speed across the wheel face when the device is actuated through a push button control. Changes in speed and feed are quickly made whenever desired. The rate of speed of diamond travel when not in contact with the wheel is automatically increased to reduce the overall truing time.

The Wheel Guard Truing Device permits a close control of the amount of abrasive removed from the wheel, thus



reducing wheel cost per piece ground. Furthermore, it trues the wheel without disturbance of table settings, and without a special positioning of the wheel head. The device operates with speed and consistency; it eliminates the neces-

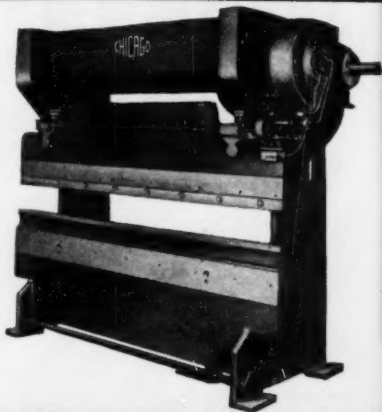


## STEEL PRESS BRAKES

### 43 Standard Sizes

Readily adapted for a wide variety of bending, forming, drawing, notching, blanking, punching, embossing, etc.

**DIES** Complete Line of Induction Hardened Dies for All Makes and Sizes of PRESS BRAKES.



# DREIS & KRUMP

MANUFACTURING COMPANY

7440 S. Loomis Boulevard, Chicago 36, Illinois



STEEL BENDING BRAKES  
BOX and PAIR BRAKES  
PRESS BRAKES

## PORTABLE ELEVATING TABLE



**Saves  
TIME  
and  
LABOR**

Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15½", leaving operator's hands free. Table swivels and locks in any position.

**SEND TODAY FOR ILLUSTRATED  
CATALOG NO. 2**

**MIDWEST TOOL & ENG. CO.  
112 WEBSTER ST., DAYTON, OHIO**

## NIELSEN Heavy Duty *Live Centers*

Adapted  
for heavy  
duty work.  
Precision type  
ball and roller  
bearings assure  
maximum capac-  
ity for high speed  
production and long  
service.

**NIELSEN, INC. LAWTON, MICH.**

Write for  
catalog on  
live centers

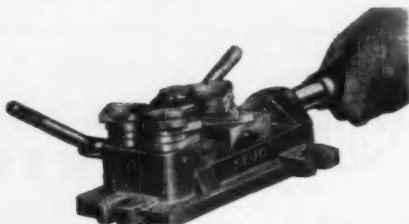


sity of skill on the part of the operator, thus relieving him of a time-consuming manual operation, and increases production.

The consistency of result obtained by automatic mechanical wheel truing makes possible improved accuracy and uniform quality of finish, according to the Norton Company.

## "Sevo" vise holds irregular shapes

An ingenious universal screw vise that instantly clamps round, tapered or irregular objects has just been introduced; the distributors are DeWilde-Jones, Inc., 181 Steuart St., San Francisco 5, Calif. The vise is unique, according to the Swedish concern which manufactures the product, called the "Sevo" vise. Its jaws consist of a series of machined and ground flat plates which hinge or swivel in any desired direction to coordinate with the shape of the held object. These jaws are so designed that they can be moved in relation to each other, and the work piece



can rest on a contact surface underneath. By turning the main screw, the locking jaws position themselves and can be locked to retain their directional position.

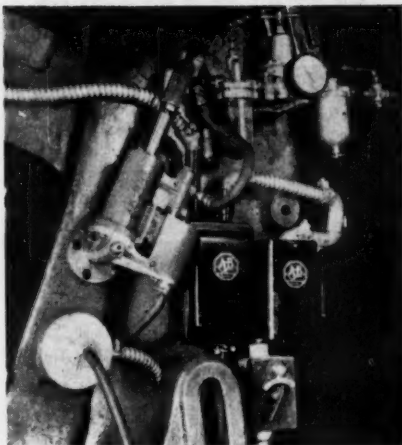
Unlike conventional vises, the tightening screw requires only a slight turn, without imposing a heavy torque, to grip the object tightly. When filing, drilling or shaping objects, the worker can save much time by the quick and universal action of the Sevo, the distributors state.

The vise jaws are made of precision ground Swedish steel. The distance between jaws is 2½" and 5", in two sizes.

### Direct clutch punch press guard

A Punch Press Guard designed for direct clutch presses having not more than 60 lbs. pull and 2" of up and down movement on the clutch tripping rod has been introduced by Tech-n-Kal Machine and Engineering, 12925 Auburn Ave., Detroit 23, Mich. The device is also adaptable to spot welders, brakes and shears. The unit is electric-pneumatic operated. The present foot treadle is replaced by an Air Clutch operator; a set of electric start buttons for each operator is installed in a convenient location on the press; these buttons are located far enough apart so that operator must use one hand on each button. Only by simultaneously pushing both buttons is the circuit completed. The Air Clutch operator then engages the clutch, allowing the ram to make one complete revolution in the same manner as when tripped by the foot treadle. Both hands are out of the danger zone as the ram descends, but are ready to pick up the next piece of work.

The foot treadle can be either



temporarily disconnected or permanently removed if desired. An anti-repeat switch and long cam will allow the ram to descend only once, unless the solenoid valve is re-energized by use of the two start buttons.

*for greater* **RIGIDITY**  
*more* **ACCURATE cuts**



*use*  
**CRITERION**

**CRITERION**  
*machine*  
**WORKS**

**BORING  
HEADS**

A full line of adjustable boring heads and bars now available. Heads 1½" to 7" dia. Carbide or high speed bars ¾" to 1½" dia. Lead screws ground **AFTER HARDENING**. Ample bearing surface, heat treated parts, interchangeable shanks. Criterion tools are the criterion. Write for free catalog and costs.

9312 SANTA MONICA BLVD. • BEVERLY HILLS, CALIF.

## PRECISION MEASURING

### SCHERR MICROMETERS



**\$9.75**

### MAUSER VERNIER CALIPER



**\$14.75**

Drop-forged steel frame easy to read. "No Glare" graduations. Guaranteed accuracy and unsurpassed workmanship. For greater savings in dollars and better satisfaction, use "Scherr Tools". Complete stock. All sizes — MM. or Inch.

For inside - outside and depth measurements in 1/1000, 1/128, 1/16mm and 1/20mm.  
If not available from your dealer, order direct.  
WRITE FOR ILLUSTRATED CATALOG

**GEORGE SCHERR CO., Inc.**  
 COMPLETE LINE OF PRECISION INSTRUMENTS  
 198 LAFAYETTE ST. • NEW YORK 12, N.Y.

A foot attachment for handling of long stock may be furnished. Plugging it into the press for blanking purposes gives an automatic operation to the press, making start buttons inactive. A limit switch can be installed in the circuit on inter-locking dies so that the press cannot be operated unless the die or work is in the home position. Only then can the press be operated with the start buttons, eliminating possible damage to the press or dies.

### Quick-setting floor patching compound

Permanent repairs to holes or breaks in concrete floors can be made during factory working hours with the use of Por-Rok Quick Setting Cement, made by The Hallemite Manufacturing Co., 2446 W. 25th St., Cleveland 13, Ohio. There need be no more waiting for week-ends or holidays to repair plant floors. When necessary, emergency patches can be installed during lunch or rest periods.



The application of Por-Rok is fast and simple. The workman simply cleans out the hole or break in the floor, mixes Por-Rok with water, and pours the mixture into the opening. Por-Rok is stated to be self-bonding, will not shrink, and requires no trowelling for a perfect finish. The patch is ready for light loads in 15 minutes, normal trucking in 30 minutes, and will support the heaviest strength of Por-Rok—4500 lbs. per square inch—has been verified by an independent testing laboratory.

## INSPECTOR'S STAMPS



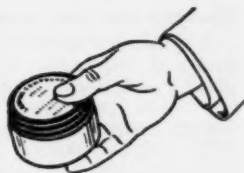
**Faster  
Identification**  
of Inspectors or Operators. Different borders may be used for different shifts. Available in 4 sizes. Write for prices today.

**NEW METHOD STEEL STAMPS, Inc.**  
 145 JOE. CAMPAU      DETROIT, U. S. A.

**FREE TRIAL OFFER**  
NO STRINGS ATTACHED



**6**  
**LIBERAL JARS**  
DIFFERENT  
GRADES



**A VALUABLE KIT**

Carton contains 6 grades of ultra-fine quality, assorted fine grit abrasive compounds suitable for a variety of work. Coarser grit compound can also be supplied.

**FOR PRECISION LAPPING**

Here's a get-acquainted offer you cannot afford to miss. Among these samples will be found the answer to many a tool room lapping problem. Hard and soft abrasives for all kinds of lapping needs. Sent post paid anywhere in the U.S.A. and Canada.

*No obligation—write today  
on your company letterhead.*

**PROVE THEM AT OUR EXPENSE!**

**UNITED STATES PRODUCTS CO.**

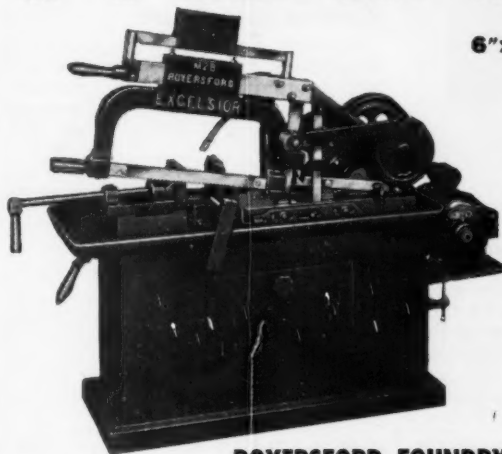
518 MELWOOD ST.



PITTSBURGH, PA.

**OFFER LIMITED**  
to those writing on  
company letterhead

**M<sup>2</sup>B WET CUT HACK SAW**



**6"x6" CAPACITY**

Occupying a floor space of only 21"x54" the M2B Hack Saw provides an efficient, low cost cutting operation. Blade lifts automatically on return stroke. Motor driven . . . V-Belt drive. 3 Speeds. Gravity feed. Swivel vise, cutting to an angle of 45°, is interchangeable. Coolant pump operated by cam and mounted on inside of base. Here's a Hack Saw which will reduce your costs and increase production . . . send for full details today.

**ROYERSFORD FOUNDRY & MACHINE CO., INC.**  
BOX B ROYERSFORD, PENNSYLVANIA

### Electro-plating rectifier unit

A selenium electro-plating rectifier, designed especially for the electro-plating and electro-chemical industries, has been announced by Electronic Rectifier Co., Inc., Rochester 2, N. Y. This useful apparatus is provided with full wave rectifier circuit, with voltage continuously variable from 0 to 8 volts, d.c., at 150 amperes capacity, or 0 to 16 volts d.c., at 75 amps capacity. Convenient voltage change terminals and d.c. output terminals are mounted on the front panel of the rectifier.

The direct current voltmeter and the ammeter on the panel are of the  $3\frac{1}{2}$ " rectangular type, with D'Arsonval movements, giving accuracy within 2%.

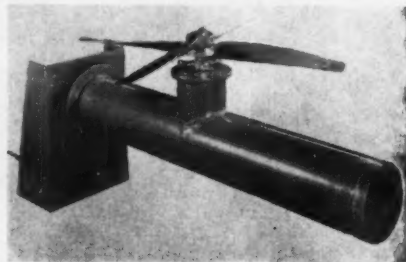


The circuit breaker is an accurately calibrated, fully magnetic type (not thermal), giving full protection at all voltage settings. The selenium stacks of the rectifier are triple coated with synthetic enamel for lasting protection, even in the corrosive atmosphere of the plating room. Liberal transformer design and oversize selenium stacks reduce heating of the unit and permit longer life.

The cabinet is made of heavy gauge pressed steel; it is provided with a hinged top cover for easy access to the a.c. terminal strip. The unit is arranged for wall, shelf, or floor mount-

### Exhaust fan for sulphuric acid fumes

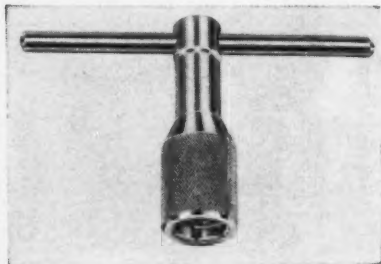
International Engineering, Inc., Dayton, Ohio, has introduced an exhaust fan designed specifically for handling sulphuric acid fumes.



The fan is used in chemical plants and steel mill or metalworking shops where sulphuric acid is used for processes such as pickling. Constructed of a recently developed material, Carpenter Stainless No. 20, (made by The Carpenter Steel Co., Union, N. J.), the unit is said to give many times the useful service life of fans made from other materials.

### Tap wrench for supplementary use

A new tap wrench, intended for supplementary use in the machine shop has been introduced by Dahlstrom Manufacturing Co., 2506 W. Larpenteur Ave., St. Paul 8, Minn. This tool is



designed for quick changes of taps by using Dahlstrom Tap Adaptors. It accommodates taps in sizes from 8-32 to  $\frac{3}{4}$ ". The tool is made of polished steel and weighs  $6\frac{1}{2}$  ounces.

### Self-locking place bolt

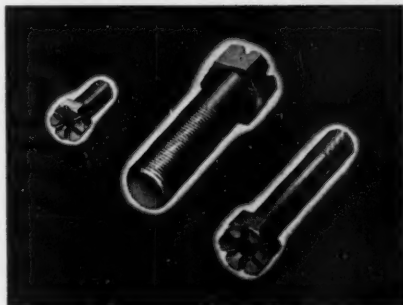
A new slotted-type "place" bolt requires no nuts, washers or other devices to lock against vibration when drawn up against a rigid seat. It has been introduced by National Screw & Manufacturing Co., 2440 E. 75th St., Cleveland 4, Ohio.

Cold-headed "place" bolts are claimed to be fully reusable, one-piece and all-metal, and can be made of carbon as well as alloy steel. They are available in a range of American Standard sizes from  $\frac{1}{4}$ " to 1", in coarse or fine thread pitches.

The "place" bolt's spring-action head not only establishes the locking action but also insures against fatigue, impact or shock failures. Upset slots across the top of the head divide it into six equal segments. Upset operation also forms a narrow circular recess under the head and next to the shank. The bearing area is the surface under the head and outside the recess. As the bolt is drawn up, the upward pressure

on the bearing area slightly displaces the segments on top of the head, to effect the diaphragm spring action.

Grain flow is continuous through shank and head segments for maximum



strength, and the shear section of the head is stronger than the mean equivalent area of the thread. The "place" bolt as a result is always capable of carrying a load equivalent to that of a conventional bolt or cap screw.

## Adjustable MULTI-DRILL for Production Drilling

9" DRILLING AREA  
AVAILABLE WITH 2 TO 8 SPINDLES

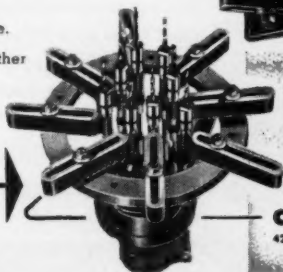
- Designed for accurate, high speed production drilling
- RUGGED CONSTRUCTION
- Quick, easy adjustments to **any** hole pattern on or within a 9" circle;  $\frac{1}{2}$ " minimum center distances; Drill sizes  $\frac{1}{16}$ " to  $\frac{3}{8}$ "
- Special adaptations available.

MULTI-DRILLS are made in other sizes and models.

Write for details and name of your nearest Distributor.

• **Locator arms are designed for fast, easy adjustment**

Dependable Performance...  
proven by industry

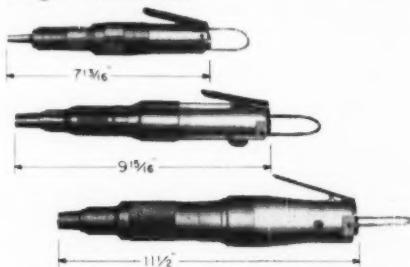


### I-R cushion clutch air screw drivers

Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., announces a line of cushion clutch air screw drivers in three basic sizes for general manufacturing operations. These tools are expected to have wide applications among fabricators of metal products, in automotive, aircraft, and other fields using screw assemblies.

The cushion clutch construction consists of two units—an engaging clutch and a torque limiting clutch. The engaging clutch enables the screw driver to be moved from screw to screw without stopping the motor—since slight forward pressure on the tool is necessary to rotate the bit. The ball-type torque limiting clutch permits adjustment for precise torque control, and enables the operator to drive all screws to the same degree of tightness. This ball-type design is noted for absence of any rotary impact, which maintains torque requirements uniformly, as well as reducing work spoilage, thereby in-

creasing production. Ball-bearing construction keeps friction to a minimum, for more accurate torque settings and longer clutch life.



These cushion clutch screw drivers have adjustable exhaust deflectors, which permit operators to direct the exhaust air as desired. Other features include conveniently located throttle and reserve valves, bit holders which permit quick and easy changing of bits and finders, comfortable handles, compact and rugged construction, and ample bearings for minimum friction.

USE  
**ACME**  
RED OR BLUE LABEL  
PRECISION  
**DOWEL PINS**

WRITE FOR CIRCULAR

Two cylindrical Acme Dowel Pins are shown. To the left is a small robot character with a circular head, a body with a triangle, and stick-like arms and legs. Arrows point from the text 'WRITE FOR CIRCULAR' to the robot and from the robot to the dowel pins.

## SAFEGUARD

EXPENSIVE DIES AND  
MACHINE PARTS

Acme Dowel Pins break before bending or mushrooming—thus saving expensive equipment from ruin through misalignment. Order standard sizes from stock. Attractive prices on special sizes and large quantities.

**Acme Industrial Company**

Makers of Standardized Jig & Fixture Bushings  
210 N. LAFLIN ST. CHICAGO 7, ILLINOIS

THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS

The screw drivers are available in Series 000 for driving small screws up to No. 8 free-running or No. 5 self-tapping; Series 00 for medium screws up to  $\frac{1}{4}$ " free-running or No. 10 self-tapping; and Series 0 for large screws up to  $\frac{5}{16}$ " free-running or  $\frac{1}{4}$ " self-tapping.

### **Flextite contains new bonding ingredient**

A new stabilizing ingredient has been added to Flextite that speeds up action in sealing off leaks and water seepage in concrete walls, it is reported by Flex-rock Company, Filbert & Cuthbert Sts., Philadelphia 4, Pa., the manufacturer.



The new Flextite provides quicker action and more thorough bonding, hence increased protection. A liquid chemical to be mixed with cement or cement and sand, Flextite produces a mortar that is easily handled and fast-setting. Forced into an opening—even against hydrostatic pressure—flextite is said to seal off severe, fast-flowing leaks in engine rooms, elevator pits, tunnels, dams, tanks in a matter of minutes.

The material is also recommended for plaster-coating walls above or below ground or water level, for pointing up spalled areas, for converting wet, damp factory basements into dry, useful space.

**FOR CASE-HARDENING**  
That Occasional Piece or Quantity  
Production Job, Have on Hand



**A QUALITY PRODUCT  
SINCE 1910**

**10 LBS. OR 10 TONS**

Insist That Your Dealer Supply  
Genuine Ferro Case or Write

**The C. G. Buchanan Chemical Co.**  
N&W Ry. & Baker, Norwood  
Cincinnati 12, Ohio

*"Get them from Gillen"*



**John Gillen Company**  
INC.  
2542 SOUTH 50th AVENUE • CICERO 50, ILLINOIS

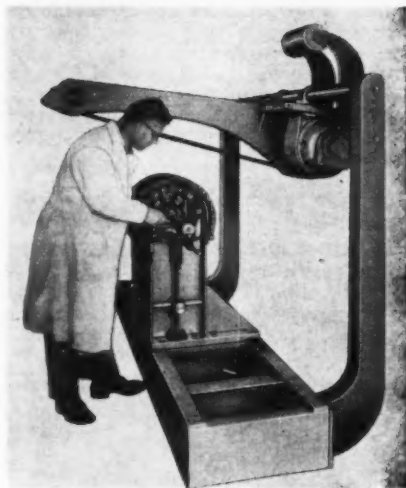
### Dynamic balancer for rotors, gears, etc.

The new Wagner Universal Dynamic Balancer provides a simple method of placing armatures, rotors, pulleys, flywheels, gears, hubs, drums, etc. in true dynamic balance. The device has been announced by Industrial Engineering Equipment Co., 122 E. Fourth St., Davenport, Iowa.

The part to be balanced is placed on the balancer with shafts resting on ball-bearing rollers, then rotated to determine the position of dynamic unbalance so that corrective weights can be added.

The driving mechanism consists of an arm with a set of five v-belts driven by a 5 h.p. motor. Balanced to stand in up position normally, it is lowered by the operator until the belts touch the equipment to be rotated. A starting button is pushed and when the desired speed has been reached, the arm is raised.

While rotating, the shafts are marked with pencil or crayon. Because un-



balance causes the shaft to rotate off center, the markings will appear on one side thus showing where weights should be added. Rotation can be stopped al-

BEWARE OF  
IMITATIONS



Our  
machine  
carries the  
Butterfly  
trade  
mark.

Registered  
U.S.  
Patent  
Office

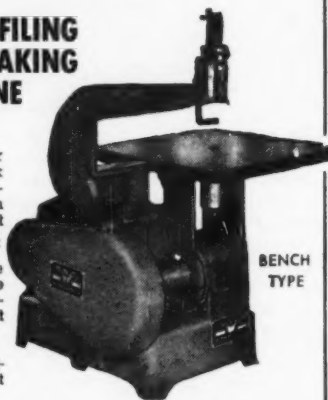
## TO INCREASE PRODUCTION TO IMPROVE EFFICIENCY

USE  
**BUTTERFLY FILING  
AND DIE MAKING  
MACHINE**

MOUNTED  
ON  
PEDESTAL

This is a powerful machine, for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models No. 16, No. 14, "EL" and Mode "D". The larger the model, the larger the stroke and therefore more filing is performed, furnished with or without pedestals.

Constructed as per Specification of U. S. Naval Aircraft Factories.



BENCH  
TYPE

**HARVEY MFG. CORP.**

Dept. H, 161 Grand St., New York Phone: CA nal 6-5170

most immediately by lowering the arm and pushing a reverse button.

The balancer is six feet in height, requires 54" by 96" of floor space and weighs approximately 1600 lbs. It will balance equipment up to 48" diameter, 4000 lbs., and 80" between the vertical standards.

### Commander coolant table has self-contained coolant system

A new coolant table, equipped with a built-in pump and reservoir and eight semi-rigid, flexible metal coolant nozzles is introduced by the Commander Manufacturing Co., 4227 W. Kinzie St., Chicago 24, Ill.

The Commander Coolant Table, with its self-contained coolant system, takes advantage of a shorter coolant circulating stream to deliver full volume flow from one to eight nozzles, assuring an adequate supply of coolant at the precise point the user desires.



The manufacturer claims greater convenience, simplicity and portability for this coolant table, since long hose lines and floor units are eliminated. The table may be easily moved from one machine to another, when required. The semi-rigid flexible metal nozzles can be quickly and easily set to any position. The flow from each nozzle may be individually controlled from a trickle to full volume. The table surface is precision ground to provide a smooth working surface and this squareness, plus adequate coolant produces better holes. The continued use of the coolant table is stated to save jigs and fixtures as well as to increase tool life.

## ARTUS PLASTIC SHIM

### AND FEELER GAUGE STOCK



The COLOR  
tells the  
THICKNESS

Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting. 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors—12 thicknesses (.001-.030). Bound together. \$4.90

Order today. Immediate delivery.

INDUSTRIAL PRODUCTS SUPPLIERS  
201 S. Dean St. Englewood, N. J.

## WHO

The old reliable...  
Wm. H. Ottemiller Co.,  
of course.

## WHAT



Precision, milled-from-the-bar Cap Screws, Set Screws, Milled Studs and Coupling Bolts.

## WHEN

Some numbers we can ship immediately—others, well, you know how it is, they'll take a little time.

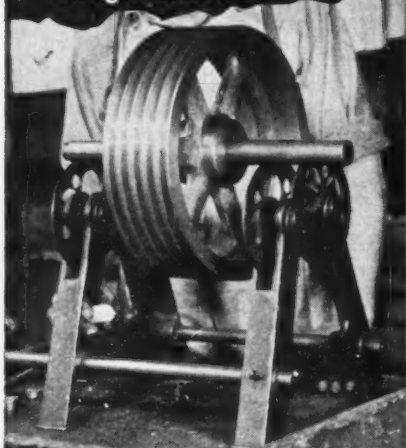
## WHERE

For special jobs contact us, for catalog items see your local Industrial Distributor



Wm. H. Ottemiller Co.,  
YORK, PENNA

## Balancing Tools for Small, Medium or Large Work



Sundstrand offers a complete line of balancing tools which will save their cost quickly on truing or balancing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears, shafts, fly wheels, pulleys, etc. Standard swing sizes range from 21 inches up to any swing desired. Length between standards ranges from 20 inches to any length desired.



Checking balance  
of lathe spindle.

### FREE DATA

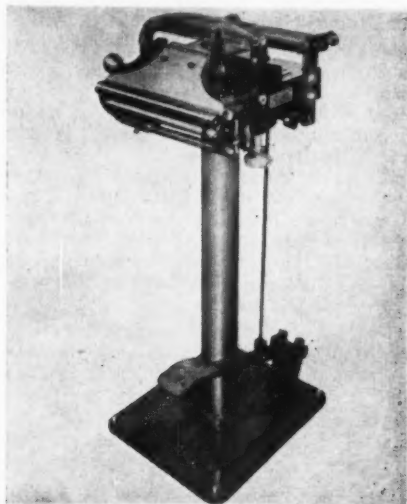
You can obtain complete information on Sundstrand Balancing Tools by writing for bulletin #14.



**SUNDSTRAND MACHINE TOOL CO.,**  
2535 Eleventh Street, Rockford, Ill., U.S.A.

## Improved metal forming machine

A new model "Bendit" Metal Forming Machine is announced by Kilham Engineering, Inc., Plainville, Mass., with capacity to bend 15" of 18-gauge mild steel or its equivalent. This machine forms sheet, strip and rod stock and small tubing into many complex as well as simple shapes.



The manufacturer states "Bendit" will form any desired radius from  $1/32"$  to  $3/8"$ , will make boxes up to  $15" \times 15" \times 5"$ , handles low ductile materials, also plated or painted metals, without fracture or injury to the surface where the radius of bend is large enough to avoid cracking the paint. Bends of any angle, including complete folds, and partial bends can be made.

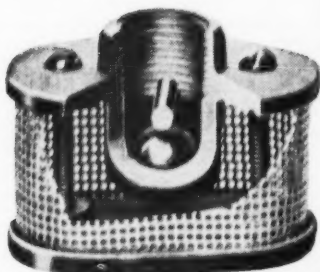
The machine was developed primarily for short run production work, such as forming aircraft components. It eliminates the need for dies and intricate tooling, is provided with positive stops and gauges for accurate duplicating and is open ended front and back for feeding long strip stock.

Interchangeable bending blades of soft steel are supplied, to be cut or sawed to size to meet job requirements. The actual bending is done by a hardened and ground steel roller.

---

---

## COMBINATION STRAINER AND CHECK VALVE



### For use on All Kinds of CIRCULATING PUMPS

Keeps pumps primed, ready to start instantly. Prolongs life of worn-out pumps. Saves operator's time. Simplest, lowest costing, most satisfactory device used.

Strainer comes apart from top, so no pipes need be removed and no joints broken if it needs removal for cleaning. Write for prices.

---

---

**LEOMINSTER TOOL CO., Inc.**

**Leominster, Mass.**

---

---

### District Managers MACHINE and TOOL BLUE BOOK

These men are excellently equipped by training and experience to work with manufacturers, advertising agencies and others interested in the promotion and sale of their products to readers of MACHINE and TOOL BLUE BOOK. Contact direct or through our Wheaton office.

**NEW ENGLAND and EASTERN N. Y. STATE**

Dan E. Reardon  
Box 259  
South Glastonbury, Conn.  
Telephone: GLastonbury 3-2400

**NEW YORK METROPOLITAN AREA**

Alvin E. Wailes  
c/o Hitchcock Publishing Co.  
55 W. 42nd Street  
New York 18, N. Y.  
Telephone: LAckawanna 4-4528

**PENNA., N.J., & S. ATLANTIC STATES**

Raymond J. Setsema  
c/o Hitchcock Publishing Co.  
55 W. 42nd Street  
New York 18, N. Y.  
Telephone: LAckawanna 4-4528

**WESTERN N.Y. STATE, WESTERN PENNA.**

Ralph E. Helfrick  
1507 Edgetfield Rd.  
Cleveland 24, Ohio  
Telephone: HIlcrest 2-0189

**OHIO, EASTERN MICHIGAN, INDIANA,  
KENTUCKY**

Henry J. Smith  
3529 Radcliffe Rd.  
Cleveland 21, Ohio  
Telephone: ERview 1-0550

**MIDDLE WEST, WESTERN MICHIGAN**

James C. Stewart  
222 E. Willow Ave. Wheaton, Ill.  
Telephone: WHeaton 8-3400

**DENVER, COLORADO**

Henry J. Niekirk  
1838 South Emerson St.  
Denver 2, Colo.

**CALIFORNIA & ARIZONA**

Keith Evans  
3757 Wilshire Blvd.  
Los Angeles 5, Calif.  
Telephone: DU 8-2981

**OREGON & WASHINGTON**

Lloyd Thorpe  
Telephone: ELliott 5919  
209 Seneca St. Seattle 1, Wash.

**HITCHCOCK PUBLISHING CO. Wheaton, Illinois**  
Telephone: WH 8-3400

# DU DRILL

## THE MIRACLE DRILL . . .

WITH THE  
**WELDED  
TUNGSTEN-  
CARBIDE TIP**

Drills High  
Speed Steel —  
Other Hard  
Metals and Ce-  
ramics — Glass  
— Plastic. No  
Metal Too Hard

No drill equals DU-DRILL in performance! Positively drills the hardest metals — anything between Rockwell C-35 and C-84 it finds easy. DU-DRILL cuts, it does not anneal, burn or melt.

Write for free information now!

**COFFEY-CUMMINS MFG. CO.**  
16 NORTH MARENGO AVENUE  
PASADENA 1, CALIFORNIA

## LOCKJAW

All-purpose  
work clamps.  
Now in two Sizes!

Set-ups stay put when Lockjaw grips with both downwards and sideways pressure . . . grip is sure, powerful, self-locking . . . eliminates cumbersome bolting and clamping . . . saves time and work spoilage. Use Lockjaw on planers, radial drills, shapers, milling machines, surface grinders, boring mills and lathes.

Two sizes: Model B for large tables. Lighter Model A where table space is limited. Interchangeable jaws to fit work contours.

Write today for Bulletin 140-A.

**RIVETT**

**LATHE & GRINDER, Inc.**

Brighton 35, Boston, Mass.

Dept. MBRA 12

For More Precision Work

RELY ON RIVETT, The Master Craftsman's Master Tools

## Cadillac hydraulic marking machine

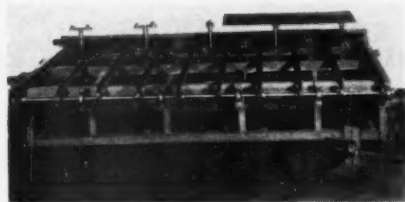
A compact, self-contained, hydraulic marking machine, designated as Model No. 45, has recently been introduced by Cadillac Stamp Co., 17315 Ryan Road, Detroit 12, Mich. Among this unit's advantages are included a full range of marking depth controlled by just one lever. The Model 45 marks by a rolling method, in comparison to punch press operation, thereby reducing the pressures to a small fraction of those otherwise necessary for indenting. This is said to minimize the possibilities of fracturing and distorting the parts being marked.



Dimensional uniformity is not necessary to produce uniformity of marking with the use of this device. According to its manufacturers, the Cadillac Model 45 will mark any shape and marks on uneven surfaces with ease. The single control governs the full range of pressure, from very light to extra heavy marking. The machine's maximum capacity is up to 110 one-inch impressions per minute.

### Liftveyor and Stripveyor for sheet metal handling

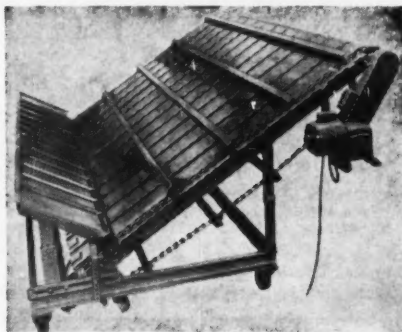
A new type of materials handling equipment that is stated to pay for itself in less than 100 days is announced by the Fried Steel Equipment Manufacturing Corp., 528 East 119th St., New York, N. Y., makers of materials handling devices.



The Liftveyor shown above, permits rapid clean-cut, wide shearing to .005", regardless of the material. Flexing of the sheet is eliminated by a series of plungers which rise to the table height of the shear, then after shearing, lower to a point below the back gauge level, thereby placing already sheared material on the endless, revolving belts of the Stripveyor which convey sheet beyond the shear frame. The Stripveyor will not mar or scratch any high polished material, the manufacturers state.

Two models of the Liftveyor are in current production: the Standard model, for sheet to 1/8" thickness; and the Heavy Duty model, for plate to 1/2" thickness.

The Stripveyor illustrated below, automatically picks up strips beyond the shear frame; it is said to increase the



### UNIVERSAL DRILL BUSHINGS establish new standards of high quality

Universal Drill Bushings, produced at the big, modern plant of the Universal Engineering Company, have been first in industry for more than 25 years. They are accurately machined with superhoned bores from the finest quality steel. They are carefully inspected to insure maximum efficiency and extremely long life. Write today for complete information.



The modern home of finer production tools

**UNIVERSAL ENGINEERING COMPANY**  
FRANKENMUTH 10, MICHIGAN 156-B

# GATCO ROTARY BUSHINGS

**FOR DRILLING,  
CORE DRILLING  
ROUGH AND  
FINISHED  
BORING**

The inner race of the GATCO bushing rotates with the tool, piloting the tool accurately below or above the work—or both. Eliminates expensive tool construction—Reduces tool wear—Prevents seizure and pilot breakage—Especially adapted where precision is required.

Write for full information and prices

**GATCO ROTARY BUSHING CO.**  
1300 MT. ELLIOTT AVE. DETROIT 7, MICHIGAN  
Telephone: LO 7-3455

## HOWALD CARBIDE MILLING CUTTERS



PATENTED  
END MILL

- SQUARE BLADES Easily Replaced.
- Simple, Accurate Blade Adjustment.
- Lowest Blade Cost.
- Cutters from 1½" to 14" dia.



PAT.  
SHELL  
MILL

SEND FOR BULLETIN

**W. T. HOWALD  
MACHINE WORKS**

182 SIGOURNEY ST., BROOKLYN 31, N. Y.

STEEL

**Stanho**

PRODUCTS

**MACHINE KEYS**

ALL TYPES

Woodruff Keys Machine Rack  
Taper Pins • Straight Pins  
Cotter Pins and Other  
"Stanho" Steel Products

PRECISION ACCURACY

M-2

**STANDARD**

Since 1872 **HORSE NAIL CORP.**

NEW BRIGHTON, PA

## THE CRALEY OFFSET BORING HEADS



- Note depth of bearing.
- Tool carrying block mos. accurately fitted of any boring head made.
- Large graduated dial screw—easily read calibrations.
- Note minimized overhang.

**C. C. CRALEY MFG. CO.**

SHILLINGTON

PENNSYLVANIA



- Tension screws on opposite sides and ends of block—all cutting strain thrown against solid metal.
- Nine sizes.
- 20 years of Craley experience specializing in boring heads.

efficiency of the shear itself to 100%, cut manpower by 50%, and completely mechanize the heretofore manual handling of the sheet. This device is adjustable to any height up to 45", synchronous to shear speed, and is capable of handling any gauge sheet metal up to  $\frac{3}{8}$ " and widths as wide as allowable by a standard 24" back gauge. The Stripveyor is portable, built on swivel caster supported carriage and is supplied with floor locks to prevent creep.

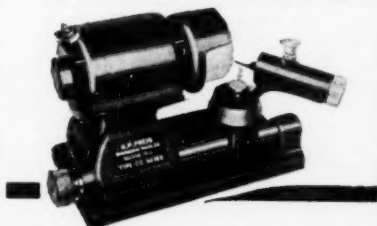
### Fil-Mar drum sanders

A complete new line of expanding-type drum sanders and sleeves is introduced by Fil-Mar Products Co., 1136 Orlando Ave., Akron 2, Ohio. All sizes can be had in coarse or fine grits, including the hard-to-find  $\frac{1}{2}$ " to 2" diameter sizes. The Fil-Mar line containing five assorted sanding drums ( $\frac{1}{2}$ ",  $\frac{3}{4}$ ", 1 $\frac{1}{2}$ " and 2" diameter) and ten sleeves (one coarse and one fine grit for each drum); a display board holding 25 sanding drums (five in each size) and a sleeve kit which contains



100 replacement sleeves in assorted sizes and grits. The drums fit any electric drill, drill press or flexible shaft provided with a  $\frac{1}{4}$ " or larger chuck, and may be used on many production line jobs as well as in pattern and experimental shops.

## PRECISION CUTTER GRINDERS



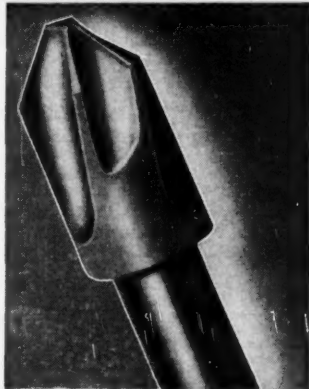
This is the Famous PREIS-PANTO Model CG Single-Lip Engraving and Routing Cutter Grinder. Surprisingly low in price because of the high-production basis of manufacture.



Easy to use because of simplicity of design and SURE to give true centers on your cutters.

**H. P. Preis Engraving Machine Co.**  
647 State H'way 29 Hillsdale, N. J.

### SOLD THRU LEADING SUPPLY HOUSES



## GROBET CHATTERLESS COUNTERSINKS

Six staggered cutting edges give shearing cut that eliminates all chatter.

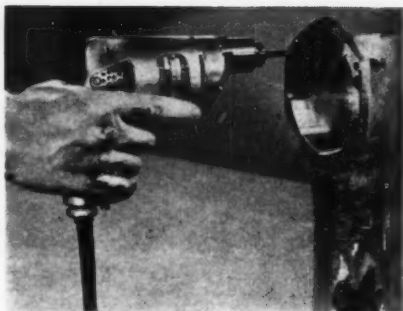
SEND FOR CATALOG C-CI.

**GROBET FILE CO. OF AMERICA, INC.**  
421 Canal Street New York 13, N. Y.  
Plants: New York, Chicago, Montreal

### Redesigned 1/4-inch Holgun drill

A new model of the 1/4-inch Holgun Drill is announced by The Black & Decker Mfg. Co., Towson 4, Md. Redesigned with a new handle shaped for ample finger room, the new Holgun is rated for heavy-duty, continuous production service. Features include full-sized ball bearings, heat-treated gears, splined gear shafts and smooth-contour aluminum housings. This heavy-duty tool is an end handle unit and is available for either standard speed or low speed. The standard speed unit has a no-load speed of 1700 r.p.m. (optional 2500, 3500 or 5000 r.p.m.); the low speed unit has a no-load rating of 600 r.p.m. (1000 r.p.m. optional).

Compact in design and weighing only 3 1/4 lbs., the new Holgun is stated to be especially useful in "close corner" drilling and for long hours of continuous operation, due to its low fatigue factor. It is powered with a Black & Decker "universal" motor and is available for 115 volt or 220 volt power lines. Stand-



ard equipment includes a 2-pole automatic-release trigger switch and locking pin, 3-wire cable and plug, 3-jaw geared threaded chuck and key.

### Sheffield electronic gage checkers

A new remote electronic gaging head is now being supplied with the Model N-6 Internalchek according to a recent announcement by The Sheffield Corporation, Dayton 1, Ohio. Standard dual

## HIGH SPEED PRODUCTION CONTINUOUS OIL GROOVING

**WICACO CONTINUOUS OIL GROOVER** cuts grooves of all descriptions, internal or external, continuous or intermittent.

Send us samples for grooving. We will return them cut to specifications, with a record of time and cost estimate. No obligation.

*Ask For Descriptive Booklet And See How  
You Can Improve Your Production.*

**WICACO**

MACHINE CORPORATION

WAYNE JUNCTION, PHILA. 44, PA.

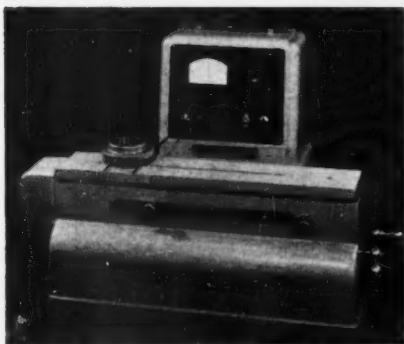
Manufacturers of

Precision Machinery and Machine Parts  
Roller Bearing Twister Spindles—Spindle Oiling Machine  
Precision Internal Grinder—Screw Machine Products

SINCE  
1868



amplifications are 1,000/2,000, 300/3,000, 5,000/10,000 to 1 with other amplifications available on special order. This instrument is normally used in the tool room or gage laboratory for checking master and working ring gages, setting snap and length gages, for checking tools and other high precision work having one or more internal dimensions. It is also useful where small runs are made of a variety of bore sizes having close tolerances. Precision blocks or masters are used as a reference in setting up the instrument. Both bench type and console base are available.



The Sheffield electronic gage head consists primarily of a highly stabilized a.c. vacuum tube circuit which gives indication on a high speed meter. A built-in regulating transformer controls fluctuations of 85-125 volts to within 1%, assuring extra long tube life. The elimination of drift in the circuit permits accurate measurements continuously or intermittently, over long periods of time without constant resetting. The scale is linear both sides of zero.

The N-6 has a wide gaging range from a minimum diameter of 0.370" to a maximum diameter of 12". The maximum gaging depth from the surface plate to the center of the diamond point is 1½". By turning the part over, another 1½" depth of the hole may be checked making it possible to explore a hole 3" deep throughout for diameter, taper, bell mouth, and out-of-round conditions. Capacity of the standard instrument is sufficient to accommodate an A.G.D. ring of the largest size.



## CARBIDE TOOL GRINDERS

HAMMOND Carbide Tool Grinders will soon pay for themselves through greater wheel economy, longer tool life and faster grinding.

AMERICA'S MOST COMPLETE LINE.

Model WD-10 Wet or Dry 10" Carbide Tool Grinder.

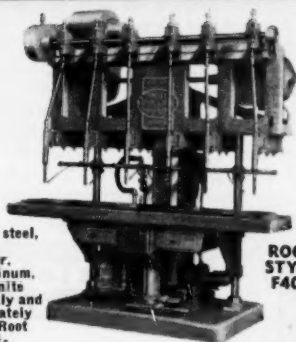
6", 7", 10", 14" Wet or Dry—also Chip Breaker and Diamond Finishing Grinders.

WRITE FOR CATALOG 225

*Hammond Machinery Builders*

1614 DOUGLAS AVENUE KALAMAZOO 54, MICH.

## USE MULTI DRILLERS



Drill steel, iron, copper, aluminum, masonite quickly and accurately on a Root Multi-Drill.

ROOT  
STYLE  
F404

Power feed machinery with adjustable spindles allows many jobs to be handled on one machine. Send sketches of drilling jobs for free estimate.

B. M. ROOT CO., YORK, PA.

## Frauenthal heavy-duty grinders

The 2200 Series heavy-duty, double-head precision grinders developed by A. Harold Frauenthal, Inc., Muskegon, Mich., are designed for high-precision grinding of unusually large parts. This basic design distinguishes them from the usual metal-cutting machine tools that depend upon auxiliary attachments to make them partially adaptable to grinding.

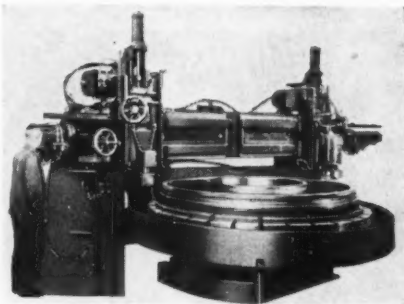
The combination of rugged construction and a swing range up to 150-inch diameter, permits the grinding of diameters and parallelism faces consistently to the tolerance of .0002" to .0003" at their maximum swing. Angular accuracy is produced with less than .0005" tolerance in 72 inches, in flatness, squareness, concentricity, roundness and taper.

The table is a heavy semi-steel casting, 140" in diameter, with deep radial ribs to prevent deflection, and with radial T-slots for clamping the work-piece. The table is seated and securely bolted to an extra-large flange on the spindle. The table drive is of the worm type.


The spindle is a semi-steel casting, accurately ground. Pre-loaded anti-friction roller bearings carry the spindle in the main spindle-housing. Inherent alignment is maintained by the wide spread of these bearings. Each bearing is designed for independent adjustment, to provide a suitable pre-load. The lower, or aligning bearing, is designed to permit expansion or contraction of

housing or spindle, due to temperature changes, without affecting the load or accuracy of either bearing.

The main spindle housing is supported and anchored at both the top and bottom of the unit. This stabilizes the table, eliminates vibration, and permits faster grinding or turning, with precision results. The superstructure, carrying the two grinder heads, is not an integral part of the main spindle-housing, but is anchored independently.



The table drive is a self-contained, infinitely-variable speed, reversing unit, with a remote-control dial speed indicator. Push-button control permits the operator to increase or decrease table speed instantly for efficient grinding. Handwheels for horizontal and vertical feeds are positioned so that the operator can easily control the grinding-spindle heads and keep close adjustment of the grinding stroke. The range of table speeds is from 2.25 to 13.51 r.p.m., or to customer's requirements.



### A GOOD STEER


TO BETTER BORING AND FACING

Re-designed. Added Features —Six Models in ONE Toolhead	Boring, Facing, Turn- ing, Grooving, Un- dercutting.
--	--

**CHANDLER TOOL CO.**  
Muncie, Indiana

**Chandler-Duplex**

LONGER BORING & FACING TOOL HEADS



ALL Sizes  
Have Power  
Feed for Facing

Write  
for Details

## **SawMore** METAL CUTTING MACHINES

**FAST METAL CUTTING  
... MADE EASY!**

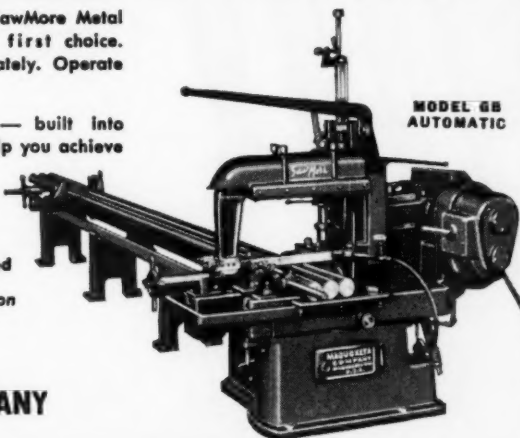
If it's speed you need . . . SawMore Metal Cutting Machines are your first choice. SawMore Machines cut accurately. Operate at lowest cost.

These highlight features — built into every SawMore Machine— help you achieve top production.

- Self-aligning blades
- Automatic feed
- Gears—constant mesh
- Positive compensating feed

Write for complete information  
on the advantages of  
SawMore Machines

**MAQUOKETA COMPANY**  
CLINTON, IOWA



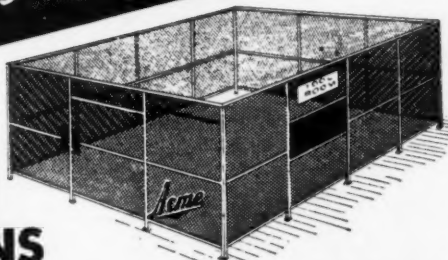
**Leaders over 50 years**  
*Established 1899*

## **TOOL CRIBS and PARTITIONS**

Standard Sections Woven Wire Mesh Panels and Doors to enclose Tool Cribbs, Stock rooms and other enclosures.

**IMMEDIATE DELIVERY**

*Write for Catalog*



**Acme Wire & Iron Works**  
3519 E. CANFIELD — DETROIT 7, MICH.



## END MILLS and HOLDERS — by Reltool

Precision processed of finest high speed tool steel, and scientifically heat treated for long cutting life . . . Reltool End Mills are famous for long cutting life. Available in single- and double-end types, in small and large diameters, with 2, 3, and 4 flutes, with straight or ball ends, in over 1000 stock sizes.



• RELTOOL END MILL HOLDERS are made in both Tang and Draw Bar Style, and with Morse or Brown & Sharpe Taper. Sizes over  $\frac{3}{4}$ " have Dual Set Screw. For complete list of sizes and prices see Reltool Catalog No. 50 and latest Discount Sheet.

**Reltool CORPORATION**  
RELIABLE METAL CUTTING TOOLS

4540 W. BURNHAM ST. • MILWAUKEE 46, WIS.

## Improved drill and carbide grinder

Several refinements and improvements have been added to the Sterling Drill and Carbide Grinder according to its manufacturer, McDonough Manufacturing Co., 1500 Galloway St., Eau Claire, Wis.



A simplified adjustment compensates for grinding wheel wear, thereby improving the accuracy of setting the machine for various drill diameters. Another improvement is the permanent mounting of a diamond wheel dresser on the drill grinding wheel guard. It is always available for easy dressing of the wheel and when not being used, swings back out of the way so that it does not interfere with the drill grinding operation.

On the carbide tool grinding side, a graduated quadrant has been added to the table, making it simple to set the clearance angles accurately. A diamond holder for dressing the wheel on this end is also furnished as standard equipment.

A light fixture mounted on a flexible tubing which allows positioning of the light at either end of the machine is also now standard equipment.

# The internal gage that's RIGHT for war production conditions **COMTORPLUG**

Gages precision bores to fractions of .0001"

War production conditions intensify the need for a gage that gives high precision yet is Rugged, Automatically Accurate, "Unrestricted".

Patented COMTORPLUG answers the need as no other gage can because:

- 1) Withstands typical shop use at machine or inspection bench, without lessening precision.
- 2) Trainees equal old hands in precision results, due to automatic alignment and "feel".
- 3) For Quality Control, gives actual measurement, and a fixed- not passing—reading.
- 4) Available anywhere instantly. Weighs but a few ounces. No hose, wire, or "10-ton base".
- 5) Cost is so reasonable as to be practical for all quantity gaging applications. Fits in with other gaging methods. Let it grow as it proves itself—which it WILL!

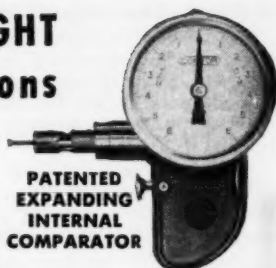
## COMTOR CO.

62 Farwell St., Waltham 64, Mass.

Request  
"Bulletin  
40"



For data on COMTORGAGE Precision External Gage, request Bulletin 30.



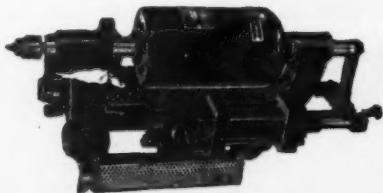
**PATENTED  
EXPANDING  
INTERNAL  
COMPARATOR**

1/8" to 8" dia.



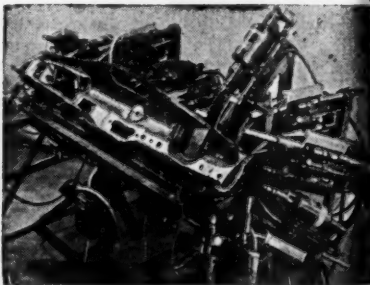
Inspection to fractional tenth-thousandths of hydramatic airplane propeller distributor valve.

## How to Simplify Production-Precision Drilling of Holes From .004" to .156" Diameter



### USE THESE COMPACT DRILL UNITS FOR SIMPLE OR COMPLICATED SET-UPS

These modern drill units speed-up many simple drilling jobs and simplify complicated multi-spindle jobs. Direct drive variable speed spindle provides speeds from 1000 to 10,000 or 2,500 to 15,000 RPM.



Sixteen Electro-Mechano air feed models electrically interlocked and controlled to drill miscellaneous holes in automobile dash board.

### AVAILABLE WITH AIR OR HAND FEED-VARIABLE SPINDLE SPEEDS

Illustrated is the 8" model with air feed and hydraulic control.

**THE ELECTRO-MECHANO CO.**  
269 EAST ERIE STREET  
MILWAUKEE 2, WISCONSIN

**Write for Bulletin BB-650.**

### **Baldwin-Lima-Hamilton pyramid type bending roll**

The first "Universal" pyramid type Bending Roll designed and built by Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa. has been operating several months in a large pipe mill in the south.

The machine was used first to roll 31½ foot lengths of 78" and 97" wide skelp into 24" and 30" o.d. tubular shape for high pressure welded pipe.

Five major design changes were made on the new type bending roll, principally to increase efficiency for production line operations. All three rolls are driven instead of the two lower rolls only. This avoids drag and, when rolling thin plate, prevents slipping. It also avoids the possibility of stalling under excessive screw-down pressure. Rolls are driven by a 100 h.p. motor, permitting rolling speeds up to 60 f.p.m.

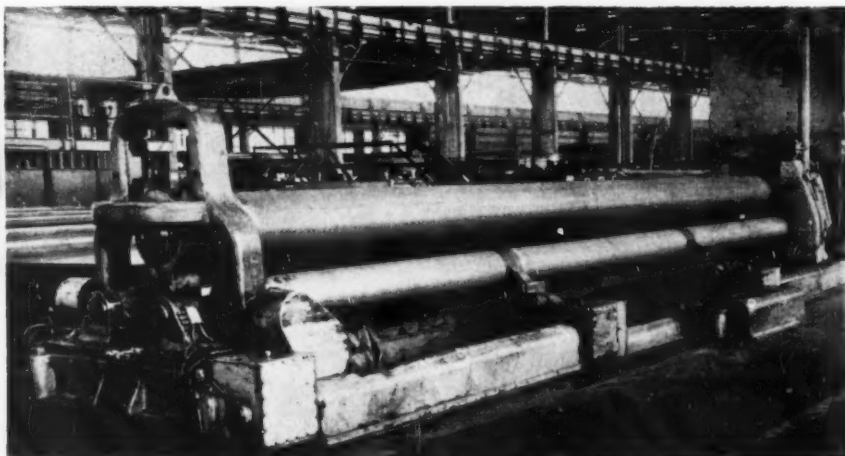
A two-speed, differential drive is provided for screw down, thus permitting instantaneous change of speed. High speed up to 30" per minute is used to position the 20" diameter top roll; and low speed up to 12" per minute is for applying increasing bending pressures. Maximum clearance between rolls is 6". The screw down is driven by a 100 h.p. motor.

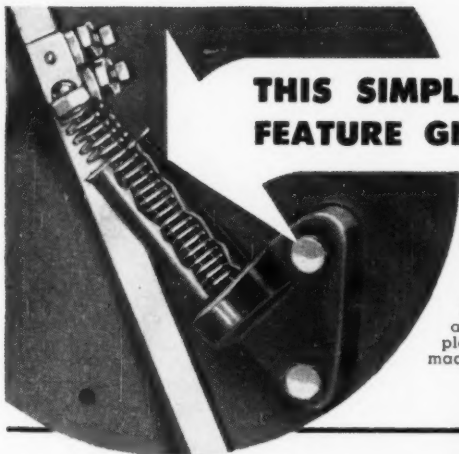
The distance between the bottom roll

centers can be varied from 18" to 24" by a motor drive. As the bottom roll centers are adjusted outward, the top roll loading decreases for a given plate. Thus, the top roll deflection can be controlled to present a comparatively straight roll surface to the plate. This avoids the "barrel effect" on the cylinder. The motor driven roll adjustment is much simpler than shimming the roll stands and housings, or using strips to offset top roll deflection. This bending roll may be used on plates up to ¾" thick.

Accessibility at the drop end of the bending roll is improved by locating the drop end hydraulic cylinder in a horizontal position. This also decreases the depth of the pit under the machine. The drop-end housing motion is achieved by the use of the hydraulic cylinder through a lever system and double quadrants. This mechanism automatically locks the drop end housing in the operating position without using locking pins and permits actuation from the operator's platform by remote control.

The gears are fully enclosed in oil-tight cases, minimizing wear and protecting the gears from scale or grit. Four pipe mills have now been equipped with this B-L-H type bending roll.





## THIS SIMPLE, SURE-ACTION FEATURE GIVES EXTRA SAFETY

**JOHNSON** puts the exclusive **SAFETY TRIP** on all models of Power Presses at no extra cost! This patented non-repeating device uses two springs to hold release lever up. If one fails, the other takes over. If both fail, clutch automatically disengages. Springs replaced in 30 seconds without stopping machine.

*Johnson*

**MACHINE  
and PRESS CORP.**

620 W. INDIANA AVE. • ELKHART, IND

IF YOU THINK SAFETY FIRST, think first of Johnson. Write for information on 8 models of open-back inclinable Power Presses now available. Ask about the new extra capacity, extra power No. 55 Press.

**Obtain Microscopically SMOOTH FINISH and PRECISION FITS on BEARINGS, GEARS, PISTONS, VALVES and SLIDES Without Special Tools or Highly Skilled Labor . . . IN LESS TIME! AT LOWER COST! . . . with TIMESAVER Lapping Compound.**



Has continuously served  
leading manufacturers the  
Army, Navy & Air Force  
for OVER 30 YEARS.

Does not im-  
bed or charge  
metal.  
Produces  
proper oil  
clearance.

TIMESAVER Lapping Compound action is rapid at first. It quickly but gently removes surface irregularities and surplus metal, gradually breaking down from an abrasive to a polishing compound. Finally it becomes an inert material.

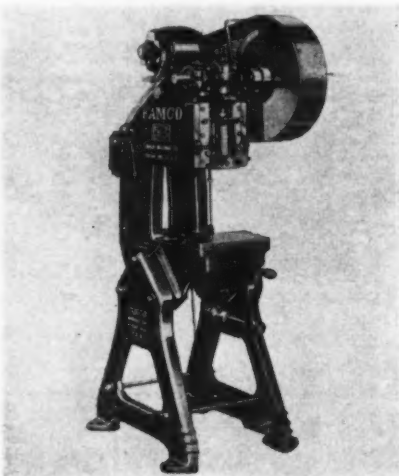
Write for **FREE SAMPLES** and booklet  
"Precision Finish"—no obligation

**TIMESAVER  
PRODUCTS COMPANY**

629 W. Washington Blvd.  
Chicago 6, Illinois

### Famco deep-throat presses

Famco Machine Company, 1320 18th St., Racine, Wis., announces the addition of five deep-throat models to its line of open back inclinable power presses. The new models are rated in 5 and 8 ton capacities, will take work 20" and 24" in diameter, and offer four shut heights from 6" to 13", with up to 3" strokes.



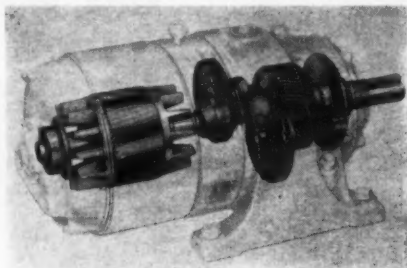
The balance of the Famco power press line consists of seven other models of from 3 to 7½ ton capacity. These models are claimed by the manufacturer to be the most complete line of small presses on the market.

### Twin pinion Syncrogear motor

A new principle in geared motors has been developed by U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif., in introducing their Type GL Syncrogear. By using two secondary pinions to drive the output gear, the firm's engineers have doubled the effective torque rating of a conventional single pinion and gear unit. Incorporating the use of a splined herringbone pinion to divide the load equally between the two secondary pinions, the Type GL Syncrogear produces high torque at low speeds while

occupying only a fraction of space required of a conventional drive.

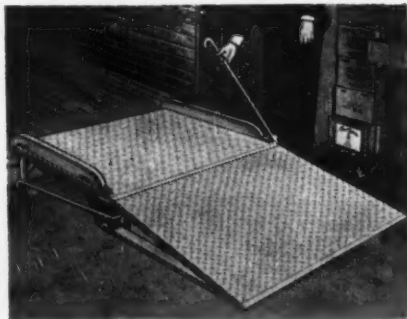
Available with ratings of 5 to 25 h.p. and with speeds from 30 to 84 r.p.m., the



Type GL has the advanced features of asbestos-protected windings, normalized castings, solid centricast rotors and Lubriflush lubrication.

### Device prevents dock board slippage

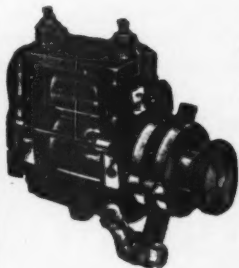
Magline, Inc., Pinconning, Michigan, manufacturers of magnesium handling equipment, have introduced a new drop lock for their line of dock board and ramp combinations. The new lock is incorporated into the ramp section of the unit and automatically drops into place against the dock, securely holding the unit in position during loading operations. It provides positive lock action, and eliminates any possibility of board slippage, the company states.



The dock board and ramp combinations, complete with the new automatic drop lock, are specially designed units for use in overcoming extreme height differences between dock and car.

## ROLL FEEDS

**8 STILL AVAILABLE  
EARLY DELIVERY**



- Fits Any Press
- Can't Slip
- Reverses Instantly
- Feeds in Thousandths
- Maintains Original Setting

Roll Feeds are available for all types of presses . . . for side or rear feeding. All attachments for installation are furnished including adjusting disc and connecting linkage. Roll Feeds can't slip as each wedge has four points of contact. Instantly reversed by merely shifting the feed finger spring from one lug to the other. A unique feature enables stock to move through the rolls with accuracy measured in thousandths! No ratchets or pawls to wear down and throw off feed spacing . . . original setting is always maintained. Friction discs and strip-feeding rolls are made of steel, hardened and ground. Bearings are of hard bronze. Roll Feeds are built to endure hard and long usage . . . and still hold to accuracy. Your presses can be made more efficient with Roll Feeds . . . models available to fit all sizes of power presses. Quality built for long dependable service. Write today for illustrated folder with diagrams and specifications. It's yours for the asking . . . so write now.

Also Manufacturers of Stock Reels.

**ROLL FEEDS CORPORATION**  
Pawtucket      Rhode Island  
An Electrix Affiliate



# VIMCO *Light*

**Prevents Tired Eyes**

**PREVENTS COSTLY ERRORS!**

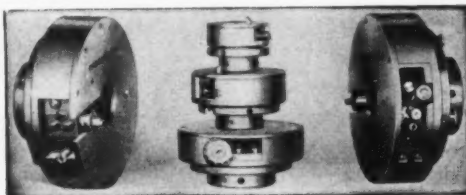
Illustrative of VimcoLights' versatility is their use by the Magna Engineering Corp. VimcoLights are aiding operator's vision and accuracy on the jigsaw attachment of Magna's popular Multiple Purpose Power Tool . . . the "Shopsmith".

Machine Tool Manufacturers also use VimcoLights extensively. They realize that although their machine is tops in design, in operation it is only as good as the worker's eyes.

Supply VimcoLights as original equipment. . . protect your machine's reputation and your customers' production.

Bulletin 74 Illustrates Our Complete Line.

**VIMCO MFG. CO., Inc.**  
109 Brayton Street      Buffalo, N. Y.



## MUMMERT-DIXON FACING HEADS

with Automatic Feed

One-way Tool Feed — 6, 9 and 10" sizes.

Two-way Tool Feed — 9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes. Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

## BOICE DIAL BORE GAGES

**ANNOUNCING  
FOR AIRCRAFT  
& ORDNANCE**



**3  
NEW  
MODELS  
REGULAR OR  
PISTOL GRIP  
1" TO 6" RANGE**

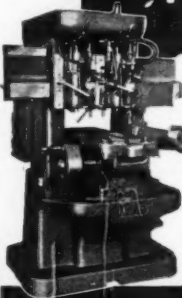
*Write for Further Information*

**BOICE MFG. CO.**

POUGHKEEPSIE, NEW YORK

*Preloaded Precision Bearings for Spindles*

**MOREY 12M**  
HIGH-SPEED  
**VERTICAL  
PROFILER**  
and MILLER



*Two spindle or single spindle*

Speed and more speed in the production of interchangeable parts requiring milling of any contour or outline is yours in the MOREY 12M. Provision for increased clearance between spindles and table.

**MOREY MACHINERY CO., INC.**  
410 Broome Street New York, N. Y.

**U.S. No. 1  
MILLING  
MACHINE**

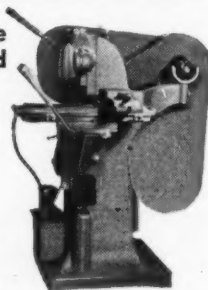
The No. 1 Value in all purpose high production hand-feed milling machines.

Send for information on power feeds, universal milling head and other efficient attachments.

**U. S. MACHINE TOOL CO.**

A Division of the U. S. Burke-Machine Tool Co.

20 East 72nd Street Cincinnati 16, Ohio



ENGRAVING

ROUTING

PROFILING

MODELING



## GREEN ENGRAVER

**Proved Profitable —**

Machine Tool, Radio, Electrical  
and Instrument Mfrs., Sales Pro-  
motion and Advertising.

Fast, rugged, convenient—and **in-  
expensive**. The Green Engraver is  
tops for low-cost performance—rips  
out **precision** work on metal, plastics  
or wood . . . cuts four lines of letters  
from 3/64" to 1" on curved or flat  
surfaces . . . operates by tracing . . .  
**makes anyone** an expert . . . en-  
graves panels, name plates, scales,  
dials, molds, lenses and instruments.  
(Also widely used for routing, pro-  
filing, and three dimensional model-  
ing.) Electric etching attachment  
available.

Special attachments and engineer-  
ing service available for production  
work.

**FREE—Fact-packed folder - Send for  
yours, today**

**GREEN**

**GREEN INSTRUMENT COMPANY**  
306 PUTNAM AVE. CAMBRIDGE, MASS.

December, 1951

# SET-UP TIME CAN BE SAVED



## with "DE-STA-CO" Arbor Spacers

"DE-STA-CO" steel Arbor Spacers with  
standard key-ways for milling, slitting, and  
gang-saw set-ups and for shimming gears  
and bearings save machinists' time and  
money for the shop—especially if they are  
stocked in complete sets of graduated  
thicknesses to save time hunting for "spares."

KEY-WAYED Arbor Spacers in 20 arbor  
diameters (from 3/8" to 4") and 19 grad-  
uated thicknesses (.001" to .125") are  
available in plainly marked tough trans-  
parent envelopes. Specials over .125"  
thick are available in popular arbor sizes  
and thicknesses, machined from bar stock,  
hardened and ground, with standard key-  
ways, identified as to thickness. • For  
speedy set-ups ask your industrial Dis-  
tributor for "DE-STA-CO" by name, or send  
for Arbor Spacer Size and Price List.  
Quantity Discounts apply to bulk purchases  
of given sizes and thicknesses.



**DETROIT STAMPING CO.**

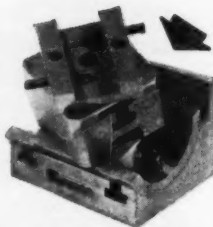
347 MIDLAND • DETROIT 3

## AMAZING . . . NEW . . . Compound angles without parallels

Yes, you can now grind compound angles in your tools without the use of angle parallels, without charts or books, without involved mathematical computations. You will save time and

money through easier and faster grinding. By using this vise for carbide sharpening you will save valuable carbide which is usually lost when free-hand grinding. Easy to use. Use on any surface grinder.

Write now for further detail and prices.  
Distributors: choice territories open.



### COMBINATION VISE and JIG CO. ORFORDVILLE WISCONSIN

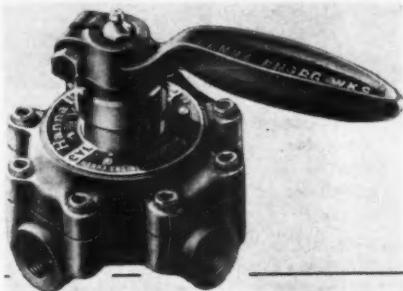
#### Hand-operated Unitite valves

Recent tests of three Unitite Valves, made by Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill., indicate a remarkably long life for these hand-operated valves. The tests have shown that Unitite Valves, incorporating the latest design and construction features, give maintenance-free operation for 10 to 15 million or more cycles.

The features which contribute to this performance include a chrome-plated stem for minimum wear; a Neoprene stem collar to prevent abrasion from ambient dust; a standard grease fitting at the top of the stem; and a lumen bronze disk. The valve handle movement is limited by internal stops to allow a 360° range of handle placement for the operator's convenience.

Hanna Unitite Valves are small (to accommodate installation in limited space), compact, packless and have an exterior simplicity to minimize dirt accumulation. Three mounting styles, standard, column and manifold, are

available. On standard and column mount models, all pipe ports are on one plane to provide for a clean piping arrangement. The manifold mount permits close grouping of several valves,



as all ports are in the mounting face of the valve. Disassembly is simple, since the bonnet and all body parts may be removed without disturbing the piping.

Unitite Valves are made for 3 or 4-way operation by air, oil or water, up

OPEN

CLOSED TRADE MARK

**Plain Type**

CLOSED TRADE MARK

**Offset Type**

OPEN

## CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET

**AUTO MOULDING & MFG. CO.**

**1110 E. 87TH ST. CHICAGO 19, ILL.**

**SPECIFICATIONS:**

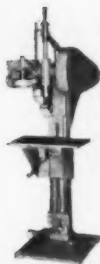
Open width 7/8" to 6"

Gage Material .040 to .125

Pin Diameter .101 to 3/8"

Lengths to 120"

**SEMI-OFFSET**



## REYNOLDS

### MAGAZINE FEED POWER SCREW DRIVING MACHINES

Assembly operations are speeded up and done more efficiently with a Reynolds. Reduces costs too. Illustrated is only one of a complete line of screw driving machines for every application. Write today for catalog.

### AUTOMATIC HOPPER FEEDS

Costly handling operations are eliminated when parts are delivered automatically to work position. Motorized hopper. Parts arranged and fed as required. Send sample of part to be fed when writing for quotation. No obligation.



## COOK & CHICK CO.

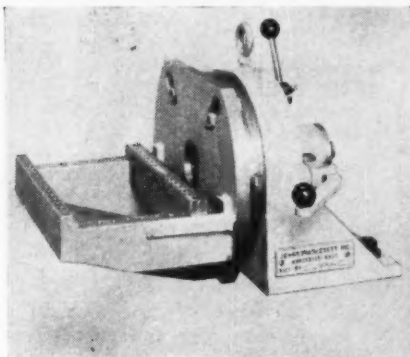
640 S. MILLER ST.

CHICAGO 7, ILL.

to 250 p.s.i. in  $\frac{3}{8}$ ",  $\frac{1}{2}$ " and  $\frac{3}{4}$ " sizes, to 150 p.s.i. for 1" and up to 100 p.s.i. for the  $1\frac{1}{4}$ " size.

### Indexing trunnion adaptable to upright and radial drills

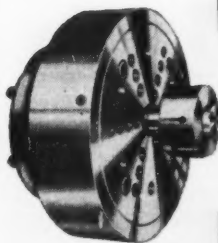
An ingenious and useful device called an indexing trunnion which is stated to be adaptable to all types of upright and



radial drills, has recently been placed on the market by Johnson & Bassett, Inc., Worcester, Mass. This device is of compact, rigid construction, and is engineered for production runs.

The J & B Indexing Trunnion is stated to simplify jig construction on drill operations. While reducing set-up time, it also increases the life of drill jigs by permitting less handling of work, thus accelerating production schedules. Its construction permits large work pieces to be handled with considerable more ease than with a box jig alone, an important factor in reducing operator fatigue.

Due to the construction of the Indexing Trunnion, the jig rotation removes metal chips, which might enter the moving parts, thus causing considerable damage. The device also eliminates abuse to the machine table. It is provided with positive dowel pin indexing by  $15^\circ$  increments from  $0^\circ$  to  $360^\circ$  by a graduated dial. A roller bearing heat treated spindle and a high carbon steel face plate provided with  $90^\circ$  tee-slots are standard equipment on the trunnion.



### SPEEDGRIP — FOR ALL INTERNAL CHUCKING

Here's the answer to fast, accurate and economical machining. SPEEDGRIP CHUCKS are being used in ever increasing quantities in plants everywhere. Write today for information on how SPEEDGRIP can speed your second operation work. Layouts will be made and prices quoted from blueprints. No obligation.

### SPEEDGRIP CHUCK INC.

822 N. WARD STREET  
ELKHART, INDIANA



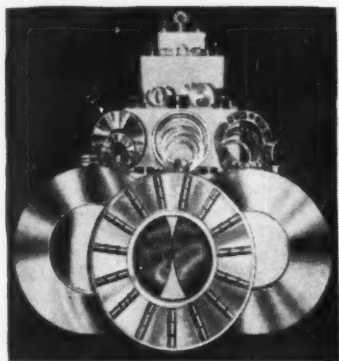
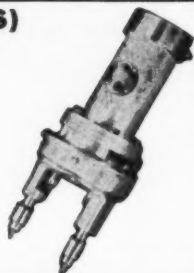
## SELLEW (Standard DRILL HEADS)

will greatly increase your drilling output  
In stock for immediate delivery.

No. OAD min. .65" max. 3.4" — 1/8" drill  
No. OD min. .9" max. 4.6" — 1/4" drill  
No. 1D min. 1.16" max. 6.33" — No. 1 M.T.  
No. 3D min. 2.5" max. 13" — No. 3 M.T.  
Heads with fixed spindles designed and built  
to customer specifications.

Send Us Your Drilling Requirements

**SELLEW MACHINE TOOL CO.** Inc. 1910  
PAWTUCKET, R.I.



## All Types of Thrust Bearings

We can make them up to 25" outside diameter. We are geared to handle all of your thrust bearing needs.

*Inquiries Invited*

**ACORN BEARING CO.**  
68 STANLEY ST. NEW BRITAIN, CONN.



6" and 150 mm  
scale

.001" and  
0.1 mm vernier

## THE HELIOS

Guaranteed Accuracy

**\$9.50**

f.o.b. New York

Importer and Mfrs. Agent

**KARL A. NEISE**

Dept. B.B.

381 Fourth Ave., New York 16, N.Y.

## CHASERS

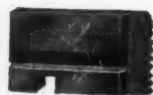
STANDARD:  
OR MADE TO YOUR SPECIFICATIONS

To Fit All Types  
of Die Heads

**QUALITY  
CHASERS**  
Sell For Less

QUALITY CHASER  
OFFERS YOU:

1. Master Workmanship.
2. Top Performance.
3. Longer Threading Life.
4. Standard sizes from stock.
5. Specials on good delivery.



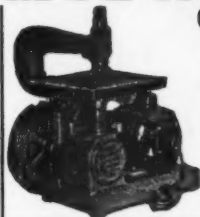
**QUALITY**  
**CHASER CO.**

Several Good Territories  
Are Available Including  
St. Louis, Mo.  
Cleveland, Ohio  
PHONE: Lincoln 4-7794  
WRITE FOR CATALOG

24000 Stephenson Hwy  
HAZEL PARK, MICH.

# MILWAUKEE DIE FILERS PROFILE GRINDERS

Give you more value for your money!



- The MILWAUKEE DIE FILER for straight-line, sharp-corner filing, sawing and lapping.
- The MILWAUKEE PROFILE GRINDER for high speed, precision grinding of curved and irregular contours.

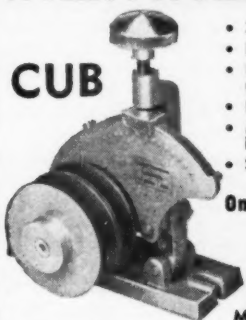
Write for Complete Details

**RICE PUMP & MACHINE CO.**  
224 N. Milwaukee St. Grafton, Wisconsin



## A VERY POPULAR DRIVE

**CUB**



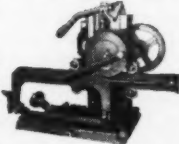
- 3.3-1 Range
- For "A" belts
- Positive alignment
- Ball bearing
- Machined cast iron
- Ship wt. 10 lbs.

Only **\$18<sup>50</sup>**

**TODAY ORDER**  
(DIE CAST MODEL \$10.50)

### STANDARD NO. 2 4 x 4 DRY CUT BENCH MODEL

- Lifts on return stroke
  - Ball bearing guide
  - Automatic cut off switch
  - Angle cutting by turning saw. (Saw turns instead of work)
- Price \$112.00 less motor FOB factory.

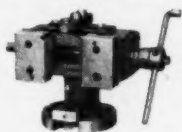


Ship. Wt. 84 lbs.

**Standard Transmission Equip't. Co.**  
70 W. UNION ST. PASADENA 1, CALIF.

## "JOHN'S" DRILL JIGS

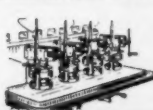
**For  
DRILLING  
TAPPING  
MILLING**  
Any Size Parts



- 3 sizes, 6", 8", 14".
- Universal jaws take diameters  $\frac{1}{8}$ " to  $\frac{3}{4}$ ".
- Precise centering.
- Fast load, unload.
- Rigid clamping.
- Plenty of chip room.

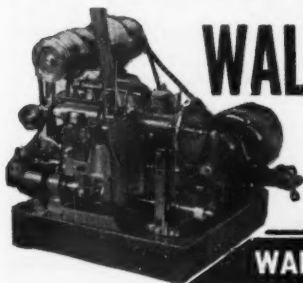
**ACCURATE  
LOW-COST  
HIGH-SPEED**

## PRODUCTION



Write for Details

Manufactured by  
**HEUSER MFG. CO.**  
1638 N. Paulina St. Chicago 22, Ill.



# WALTHAM

**PINION AND GEAR CUTTING**

*Machines*

These machines are finished according to the work to be done. Send samples or dimensioned drawings and tell us about the cutting qualities of the material and probable production per week or month. Then wait for our reply with bulletin.

**WALTHAM MACHINE WORKS**

**WALTHAM 54  
MASSACHUSETTS**



## ETALON No. 17

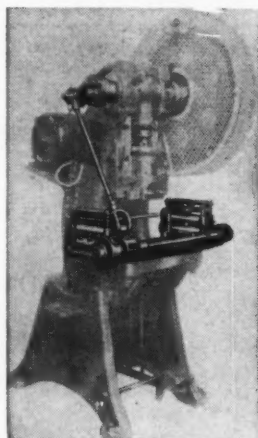
**\$19.95**  
F.O.B., N.Y.

### HARDENED STAINLESS STEEL

Known the world over for fine accuracy. Hand fitted vernier assures smooth, snug operation. COMPLETELY GUARANTEED. Supplied in ENGLISH or METRIC Graduations. Furnished in handsome form fitting wooden case.

ASK YOUR DEALER or write

**ALINA CORPORATION • 32 Broadway • New York 4, New York**



## LA BAHN ROLL FEEDS

Reduce punch press operation costs as much as 60% . . . Over 50 models and types of materials—make your punch press an automatic machine by using La Bahn precision roll feeds.

**La Bahn Machine & Mfg. Co.** Dept. HJ  
Metuchen, N.J.

## HIGH SPEED DRILLING-TAPPING UNIT

Automatic components to speed your precision defense work. Good delivery.

**3½" STROKE**  
**3/8" DRILLING CAP. (STEEL)**  
**3/8" TAPPING CAP. (STEEL)**

Write today for illustrated case histories and literature.

Export Address: STATES TRADING CO.

401 Broadway, New York 13, N.Y.

Cable Address: "STRADESO" N.Y.

**HYPNEUMAT INC., 647 W. Virginia St., Milwaukee 4, Wisconsin**

## Motch & Merryweather offers new cutting compound

A new cutting compound has been developed by Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio, manufacturers of circular sawing machines, metal cutting machinery and special production machine tools.

The new compound, known as Triple-Chip Heavy Duty Anti-Weld Soluble Oil, is stated to be valuable for heavy duty work uses. Extensive laboratory tests have established that Triple-Chip Oil withstands high heat for long periods, adheres to the tool and carries through to the cutting edge, mixes readily with water, and resists contamination. Triple-Chip also helps to keep chips from welding to the tool because of its tenacity to the tool and its maintenance of the high heat transfer of water.

Triple-Chip Soluble Oil is claimed to resist rust, and has been found non-injurious to the skin; it is odorless, smokeless and non-corrosive; it helps

## HYPNEUMAT

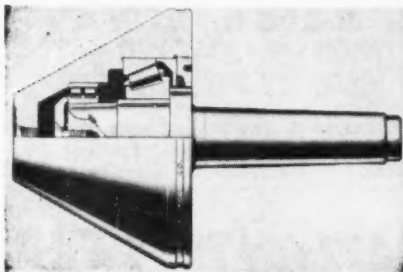


only  
**\$197.50**  
for basic unit,  
plus elec. str.  
cont. assem. illus.

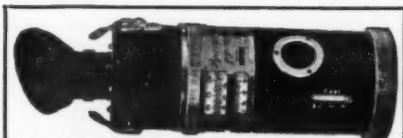
prevent flying material, and maintains its properties in storage. The manufacturer claims that Triple-Chip Soluble Oil lengthens tool life and promotes production with accuracy.

#### Heavy duty bull nose center

Capacities up to 10 tons and head sizes up to 24" are the claim for the new shank-type, bull nose center introduced by Ready Tool Co., 550B Iranistan Ave., Bridgeport 8, Conn. The centers are designed expressly for extra heavy duty work with two single row accurate anti-friction bearings. Bearings are shrunk-on (not pressed on), and spaced apart and preloaded for maximum radial and thrust capacities.



The head of the new center is of hardened tool steel and the shank is heat treated alloy steel. The sealed-in lubrication feature assures a continuous, well-balanced lubrication. The deflection ratio control accuracy is guaranteed, as is the entire center, by virtue of a written guarantee accompanying each tool.



The simplified PYRO Optical is the ideal instrument for direct temperature readings of ANY heated object in your plant. Completely SELF-CONTAINED, PORTABLE, RUGGED, LIGHT WEIGHT (3½ lbs.) and FOOL PROOF. No correction charts, no accessories and no maintenance expenses. Unique design permits temperature determination even on MINUTE SPOTS, Fast MOVING OBJECTS and of the SMALLEST STREAMS.

Write for Catalog No. 80  
THE PYROMETER INSTRUMENT CO.  
New Plant and Lab., Bergenfield 3, N. J.

## M-B "SUPER-SPEED" *Pneumatic* GRINDER



**Model SS-SR  
100,000 RPM**

The **ONLY** hand grinder with spindle speed of 100,000 R.P.M. on 100 pounds air pressure. It has revolutionized hand grinder performance. Can be directed in any working position; operates with extreme ease. Steel Construction throughout. Formed to fit the hand. Weighs only 14 ounces. **NOTE SPEED** such as to operate Tungsten Carbide Burs, Rotary Files, etc. to their **FULL** efficiency.

**Also Other Models and  
AUTOMATIC AIR LINE  
FILTERS, REGULATORS  
and LUBRICATORS**

*"Remember, Built-in Quality  
Remains Long After First-Cost  
Disappears"*

Write for Literature

Representatives in Principal Cities

**M-B PRODUCTS**  
46 VICTOR AVENUE  
DETROIT 3, MICHIGAN

**"THE ORIGINAL" MAUSER**  
**MAUSER PRECISION**  
**VERNIER CALIPER**  
**\$14.75 PPD**



**MONEY BACK GUARANTEE**  
 FOR MEASURING INSIDE,  
 OUTSIDE, AND DEPTH.  
 3 GRADUATIONS  
 1/1000" - 1/128"  
 1/10 mm. IN BACK

**NEW EXCLUSIVE CAMLOCK AND**  
**GIB IMPROVEMENT INSTANTLY**  
**FIXES SETTING, PREVENTS**  
**SHIFTING, GUARANTEES**  
**SQUARENESS OF JAWS.**  
**THE MAUSER TRADEMARK...**  
**IS YOUR PROTECTION.**

**GEO SCHERR CO INC** 198 LAFAYETTE ST. • N.Y. 12, N.Y.

**READING BENCH**  
**KEYSEATER**



Portable — move directly to job; a time saver for both small and large shops.  
 3 3/4" stroke; adaptable for other work.  
 Low first cost — prompt delivery.  
 Good dealers wanted.

**Reading Machine Co.**  
 Cincinnati 37, Ohio

**DANNEMAN**  
*Precision*  
**DIE-SETS**



**Precision-Bored**  
**on Master Plates**

**DANNEMAN DIE-SET DIVISION**  
**ACME-DANNEMAN COMPANY, Inc.**  
 201 Lafayette St. New York 12, N. Y.

**CATALOG**  
**ON REQUEST**



**REICH 3-WAY**  
**PRECISION TEST INDICATOR**

Lifetime conical bearings, stainless and non-magnetic. Sturdy construction. Needs no service or adjustment. .014" reading.

Price \$6.75 Write for folder  
**J. R. Reich Manufacturing Co.**  
 45 E. Stroop Rd. Dayton 9, Ohio



**STAMP—**  
 Numbers and Letters into Name Plates, Tags, Machine Parts, Time Checks, etc. with the ACROMARKER No. 1.

- Automatic Advance
- Stamps Tool Steel
- Replaceable Dies

**THE ACROMARK CO.**  
 15 MORRELL ST. ELIZABETH 4, NEW JERSEY

**ATLANTIC GEARS**

**SPUR**  
**SPIRAL**  
**WORM**  
**BEVEL**  
**GEARS**

GENERATED WITH  
 PRECISION ON  
 MODERN EQUIPMENT

SEND  
 SAMPLES OR  
 BLUEPRINTS  
 FOR  
 QUOTATION

**ATLANTIC**  
**GEAR WORKS, INC.**  
 198 LAFAYETTE ST. • N.Y. 12, N.Y. CA 6-1440



**CAMS**

**Specially Designed**  
**Exclusive Duplicating Process**  
**ONE CAM OR A QUANTITY**

Send Specifications for Quotation  
**L. G. SCHLECHT & SON, INC.**  
 Est. 1919  
 1624 N. Astor St. Milwaukee 2, Wis.



**DRILL THESE HOLES**  
 BY A QUICK, EASY, INEXPENSIVE METHOD  
 Your business letterhead will bring literature  
**WATTS BROS. TOOL WORKS**  
 Wilmerding, Pa.



## A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in  $\frac{1}{4}$ " to 1" diameters. Send for pricelist.

**HEIMANN MFG. CO.**

332 Lincoln Ave.

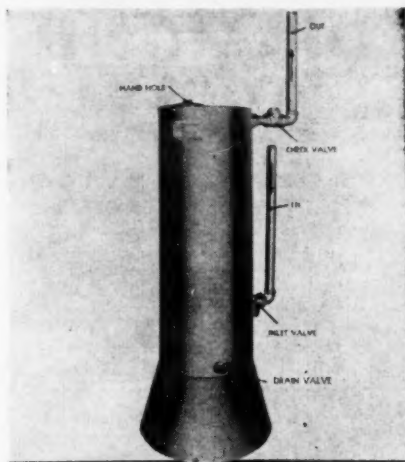
Urbana, Ohio

## Air driers for compressed air lines

Two new Vi-Speed Air Driers have recently been announced by Van Products Co., 3734-48 W. 12th St., Erie, Pa. These useful devices are stated to remove moisture, oil, dust, dirt, smoke and scale from compressed air and gas lines; they reduce humidity below the condensation point, and act as a storage tank. These air driers are of simple, sturdy construction, with no moving parts to get out of order, and with no orifices to become clogged.

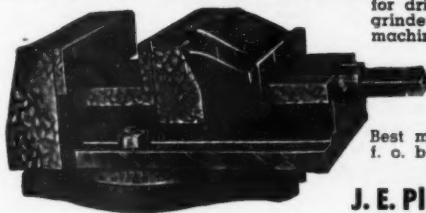
These units are recommended for use in compressed air lines for air-operated tools, instrument controls, paint sprayers and sand blasters; they are also useful in the drying of tanks in chemical and paint factories, in pipe systems, in gases and liquids. They may also be used in liquid agitation and displacement.

The Vi-Speed Air Driers are self-cleaning, self-regulating and fully automatic. The only attention required is



the addition of a small amount of filter material about every 30 days. They are available in two sizes: the Model 25 delivers 25 c.f.m., and the Model 200, shown above, delivers 200 c.f.m. of air

## PLUNKET IMPROVED VISES



We make a complete line of modern vises for drill presses, shapers, milling machines and grinders. Illustration shows our standard milling machine vise as regularly furnished and stocked.

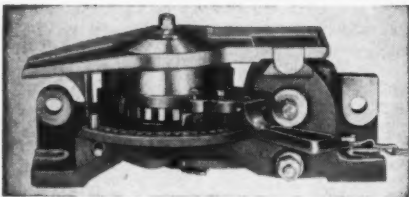
In ordering this vise give size of slot in table:  
No. 10—6" jaws,  $1\frac{1}{2}$ " deep, opens 3" .....\$68.20  
wt. 45 lbs.  
No. 20—10" jaws,  $2\frac{1}{4}$ " deep, opens 8 $\frac{1}{2}$ " .....\$92.40  
wt. 120 lbs.

Best material and workmanship. Prices are net f. o. b. Chicago. Dealer's inquiries are solicited.

Write for folder TODAY.

**J. E. Plunket Machine Co.,** 1823 W. LAKE ST.  
CHICAGO 12, ILL.

## MODEL H . . . AUTOMATIC CHUCKING and INDEXING FIXTURE



1. 1800 light cuts per hour.
2. Either horizontal or vertical position.
3. Collets changed instantly.
4. Automatically knocks piece out.
5. Ratchet or degree indexing—degree indexing added later if desired. Capacity 17.
6. Automatic indexer also added later. Model F—Both degree & ratchet indexing. Capacity up to 2 3/4".

*Write for Folders*

**J. W. DEARBORN, Ansonia, Conn.**

## DIAMOND TOOLS RESET

**PROMPT SERVICE**  
for all types of tools regardless  
of manufacture.

- Cast Beryllium Copper Matrix
- Precision Tools Centered Within .001"
- New Shanks on Each Resetting

**\$1 EACH**

**TOOLS WHEELS POWDER HONES**

*Please Write for New Catalogue*

305 East 45th Street

New York 17, N. Y.

Tel:

Murray Hill 4-0466-7-8



*Diamond*  
*Tool Research Co., Inc.*  
FOREMOST IN DIAMOND TECHNOLOGY

## BROACHING TOOLS and FIXTURES

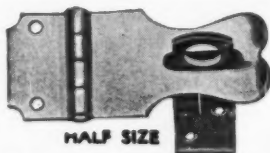
Complete engineering and manufacturing facilities for your broaching applications. Expert service for sharpening and reconditioning your broaches. Standard keyway broaches in stock.

*We invite your inquiries—Send us your part prints for recommendations and quotation.*

***Dependable, Prompt Service***

**CONANT**  
**Tool & Engineering Co.**

347 WEST 107TH STREET  
CHICAGO 28, ILLINOIS



HALF SIZE

**HASP & STAPLE**



**WITH OR WITHOUT HOLES**

**Butts and Continuous Hinges for Cabinets, Cases, etc.**

**S & S HINGE AND METAL PRODUCTS CO.**

4725-4735 IOWA ST.

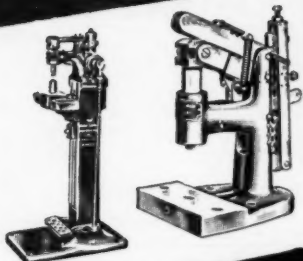
DEPT. B

CHICAGO 51, ILLINOIS

## HIGH-SPEED

### COLD RIVETERS

Thousands of our happy users originally started with us by submitting sample assemblies of their riveting work. Without charge we studied their particular problem, and returned the assembly properly riveted with complete analysis recommendations and quotations. It's a FREE service, that may save you time, materials and spillage—and speedup production. Why not write us?



### STAKING MACHINES

Is YOUR problem DIFFERENT? We have met and solved thousands of such problems—from cams and meters to toys and electrical items.

Anything for staking or riveting fixed or movable joints—anything in eyeletting, grommeting, burring, pointing with platinum, tungsten, silver—whatever your problem, we can help you. No obligation. Write us.

HIGH SPEED Hammer Co., Inc.  
311 Norton St.  
Rochester 21, N. Y.

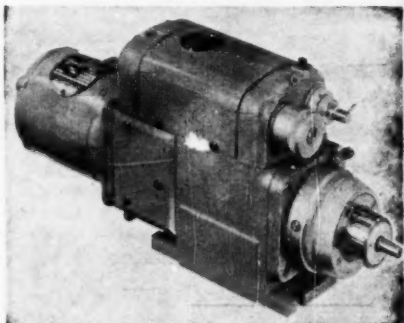
at 100 p.s.i. Larger volumes may be handled by two or more units connected in parallel, permitting one unit to be refilled with filter material while the others carry the full load without interruption of the air service. When one unit is shut off and the drain opened, the check valve in the outlet prevents reverse travel of air from the other units.

The filter material used in these devices is known as "Dryolite"; it is non corrosive, either wet or dry; it is supplied in nugget form and is soluble in water.

### Delta production hydraulic drill unit

The Delta Power Tool Division of the Rockwell Manufacturing Co., 600 E. Vienna Ave., Milwaukee 1, Wis., has announced its No. 19-150 Air Hydraulic Drill Unit. This device is of simple design, developed for high production work on drilling, reaming, tapping, chamfering, spot facing, etc. The Model 19-150 has been designed as a basic unit adaptable to special machines for

high production drilling, etc. Because of their infinite feeds, which eliminate the need for cams, the units can be adjusted to suit the requirements needed for each operation. With their built-in



switches, several of these units can then be mounted on a framework and be electrically interlocked with the fixtures, index mechanisms, etc. to become a useful special machine.

Thrust is obtained by energy received

### INSTANT ACTION RAPIDSET by HARTMANN

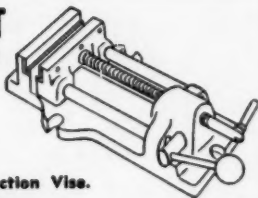
All Purpose Tool Room and  
Machine Shop Vises.

### The JAWSET

Adjustable Pressure Production Vise.

For Information Write Dept. M

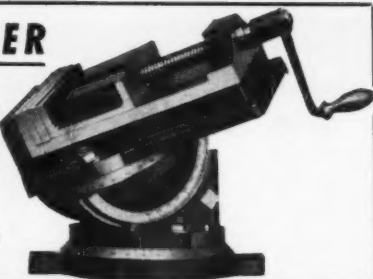
Hartmann Mfg. Co., 1637 Gould St., Racine, Wisconsin



## MAKE SET-UPS FASTER

Conserve valuable production time by using the fully universal, easily-operated MASTER MULTI-SWIVEL VISE for intricate, angular set-ups in your shop. 3 swivels instantly set any compound angle. Used in shops throughout the world. Interchangeable platen optional. Write for circular.

**DONOVAN MFG. CO.**  
80 BATTERYMARCH ST. BOSTON, MASS.



*Announcing*  
**COLONIAL #3**

**A More  
Wear-Resistant  
Drill-Jig-  
Bushing  
Steel**

• Fully  
Field-Tested

To reduce your  
bushing costs, specify  
bushings made from  
"Colonial #3"

**COLONIAL BUSHINGS INC.**  
P. O. BOX 37, HARPER STATION  
DETROIT 13, MICHIGAN

All standard COLONIAL drill jig bushings are now made from Colonial #3—a new oil-hardening steel having many times the wear-resistance of former bushing steels. Also gives greater uniformity.



## Lassy WORK HOLDER



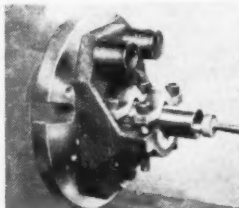
Quick, accurate setups on lathes, jig borers, milling machines, grinders and drill presses. Guaranteed accuracy .0002 in three inches. Made of finest cast iron, normalized for accuracy. Round steel insert hardened and ground. Recess in V to hold objects with heads. Holes for work stops.

Case hardened clamps with slots for quick reversing without removing screws. Eccentric counter-balance weights for quick, easy balancing. Capacity 1/4" to 2".

Model R  
(Illustrated)  
**\$49.50**

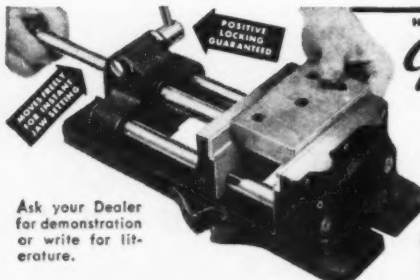
Model P with  
quick acting  
swing clamps  
**\$67.00**

F.O.B.  
Plainville.



SETUP FOR TURNING OR GRINDING. Two bolts through base fasten work holder firmly to face plate.

**LASSY TOOL COMPANY, Plainville, Conn.**  
Makers of Lassy Tappers



Ask your Dealer  
for demonstration  
or write for literature.

HEINRICH  
**Grip-Master**  
SCREWLESS VISE

**GRIPS WITH SPEED  
CUTS TOOLING COSTS**

Step up drill press production with the Heinrich "Grip-Master" Screwless Vise—with the patented "Circle Grip" hammer blows cannot break. Work is automatically leveled; jaws set instantly, effortlessly. 3", 4", 6", 8" jaw widths; ideal as base structure for drill jigs and fixtures.

**NATIONAL MACHINE TOOL CO.**  
DEPT. 101-M • RACINE, WISCONSIN

## ● LIFT HEAVIER LOADS SAFELY With a Froom

- Perfect load-centering action aligns the load every time. Eliminates strain on threads which cause ordinary eye bolts to break off.
- Heavy objects (machinery, tools, dies, etc.) can be moved safely . . . moved faster . . . intermittently jerked without fear of bolt shearing off. Made from high grade ductile steel. Prompt delivery on stock sizes.

Special sizes on quotation:

- $\frac{1}{2}$ " to  $\frac{3}{8}$ "—\$11.75 each
- $\frac{3}{4}$ "—\$13.50 each
- $\frac{7}{8}$ " to 1"—\$23.50 each
- Specify quantity and thread size.

## load centering EYE BOLT

**R. H. FROOM & CO.**  
1738 West 81st St.  
Los Angeles 47, Calif.



from the plant compressed air supply. The feed control is a sealed pumpless hydraulic system. The depth controls are adjustable positive stops. The normal cycle gives rapid advance to the work, drilling feed, and rapid return. The motion is firm, smooth, and free from lost motion.

Controls for feed, length of rapid traverse, and final depth are grouped at front of the unit and are all infinitely variable for their entire range.

Feed control is infinitely variable from 0 to 70 i.p.m., by means of a metering valve. The rapid advance is 6" per second and is variable in length up to the full stroke of the unit. The total stroke may be varied from 0 to 1½" by means of a positive stop. The return rate is 5" per second. The rapid approach and the final depth stop are accurately maintained for successive strokes. The No. 19-150 unit takes up to 5/16" drill in steel and a 1/3 or 1/2 h.p. motor. The spindle may be driven by the motor directly, through a gear train or by belts.

## Versatile, rugged sheet metal saw

A new model sheet metal saw, designed for production work in metal, plastic, sheet metal and woodworking shops, has been introduced by Bett-Marr Manufacturing Co., Hopkins, Minn. The rugged design of this new machine insures a longer service life. All castings are stress relieved by heat treating before machining. The frame is of rigid cast iron, and the ribbed table is surface ground for smoothness and accuracy.

A powerful chain drive eliminates blade chatter and permits full power at slow speeds for cleaner, faster cutting of iron and steel castings, forgings, etc. The speed range of from 125 to 2200 f.p.m. gives a quick selection of the correct blade speed for the material to be cut. An extra 8¾" cut is provided, making the saw especially adaptable to finishing castings. The Bett-Mar metal saw will cut through stacks of 50 or more galvanized sheet metal at speeds up to 15" per minute. Four sheet metal



## MILWAUKEE SURFACE PLATES

### THE KEYNOTE TO ACCURATE MEASUREMENT

Over twenty years of experience gives you "proved" performance — added assurance of quality production. Milwaukee Surface Plates. Angles, Parallels and Straight Edges are all made of the highest quality semi-steel and finished to exact dimensions.

WRITE TODAY FOR YOUR FREE CATALOG

## J. C. BUSCH COMPANY

Engineers and Machinists Since 1907

165 S. BARCLAY ST. • MILWAUKEE 4, WIS.

# SUPEREAM

## REAMERS IN *Decimal* SIZES

From .032 .033 .034 .035 all the way up-blanks can be ground to your exacting specifications, delivered in approximately 10 days. By purchasing SUPEREAM REAMERS in steps of .001 you save Time, Labor and Money in the cost of extra machining and lapping. SUPEREAM REAMERS all have ground and polished flutes and are held within .0002 tolerance.

REAMERS are also furnished in Right-hand spiral, right hand cut, as well as Left-hand Spiral, Right-hand cut.

**IN EMERGENCY PHONE  
INDEPENDENCE 3-9180**



Write for descriptive literature and prices.

**TWENTIETH CENTURY  
MANUFACTURING CO.**

1718 MONTROSE AVENUE

CHICAGO 18, ILLINOIS

### Accurate Hole Transfer Made Easy With **NIELSEN TRANSFER SCREWS**

Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 8 sizes, from  $\frac{1}{8}$ " to  $\frac{1}{4}$ " U.S.S. Inexpensive — Last for years.



Write for Circular  
**NIELSEN TOOL &  
DIE COMPANY**

1962 W. Eleven Mile Rd.  
Berkeley, Mich.

# CAMS

A complete cam cutting service for both large and small cams is offered by our **ROWBOTTOM** and **DALY** cam milling facilities.

May we quote **YOU?**

**BLAIR TOOL AND MACHINE CORP.**  
119-02 15th Ave., College Point, L.I., N.Y.

Plug Gages  
Ring Gages  
Adjustable Snap Gages  
Centerless Lapping Machines  
Pneumatic Hammers, (Chipping & Riveting) (Auto Body, sheet metal and Fender)  
Hydraulic Jacks (Auto Service and Auto body)  
Re-grinding and re-sizing of plug, Ring and Adjustable Snap Gages)

**JAS. CLARK**

139-149 17th Ave., Paterson 3, N. J.

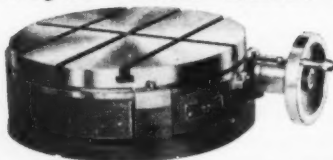
**CONSERVE  
CUTTING TOOLS  
buy the  
RIGHT  
CUTTING FLUID**



**D.A. Stuart Oil Co.**

2749 South Troy Street, Chicago 23, Ill.

## NO MORE COSTLY JIGS on small production jobs with **Troyke Worm Wheel Operated Tables**

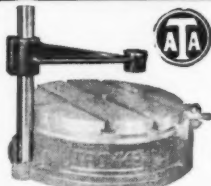


Sizes:

9 - 12 - 15 - 18 - 21 - 25

See your dealer or write for Catalog No. 17.

Fully illustrated, showing all models and applications to various work.



Drilling attachments can now be furnished for Worm Wheel Operated Tables.

**TROYKE MFG. CO.,**

Cincinnati 9, Ohio, U.S.A.

clamps and a riser bar insert to match are supplied as standard equipment for sheet metal work.



The machine is provided with a compact table, measuring 20" x 22", adequate for large work pieces. Overall depth of the unit is 34"; overall height is 44". The blade of the saw is 95½" in length. A ¾ h.p. motor is recommended for stacked sheet material. The machine will take a blade width up to and including ½". When cutting wood, plastics and soft metals, the machine will operate at 600 r.p.m.; in cutting stacked galvanized sheet metal, the speed is 165 r.p.m.; with steel and cast iron, the speed is 38 r.p.m.

#### Power press protective guard

A new sweep-type guard, said to be well adapted to short-stroke, long-die power presses has been added to its line of guards and guard accessories by Searjeant Metal Products, Inc., Box 91, Mendon, N. Y.

This new protective device, known as the Searjeant Double-Arm Sweep-Type Guard is stated to have the following outstanding advantages: When the ram is in the "up" position, both guard arms are suspended in front of the center of the bolster plate, one arm in front of the other. Thus the arms do not inter-



**"BUILT-IN" FEATURE**

**Saves 50% FLOOR SPACE**

*Hammond*  
**NO-DUST GRINDER**



• Requires only 6½ square feet.  
 • Protects employees' health — and nearby machine tools from dust and grit.  
 For 10", 12" and 14" wheels.

**WRITE FOR CATALOG**

*Hammond Machinery Builders*

1631 DOUGLAS AVE., KALAMAZOO, MICH.

## SEIBERT DRILLING MACHINE PARTS . . . . .

- Pinion Shafts

Upper Drives

Lower Drives

Universal Joints

Arms and Brackets

Slip Spindles

Bracket Spindles



Spindle Extension Assemblies

Morse Taper Adapters with and without Set Screw Slots

Shur-Lock Micro Nuts

Consult SEIBERT engineers before retooling or replacing parts on multiple spindle machines.



**Seibert & Sons, Inc.**  
E. Peoria 8, Ill.

# Empire LIVE CENTERS

ARE  
• ACCURATE • VERSATILE  
• HEAVY DUTY



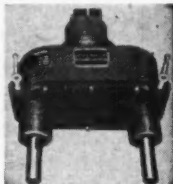
Ask your Supplier or Write for Literature.

**ROYAL PRODUCTS**  
87 UNION ST. MINEOLA, N.Y.

## PERFORMANCE PROVED THRIFTMASTER Gear Driven Eccentric Type

### Adjustable DRILLHEADS

- Rugged FULL BALL BEARING Construction—hardened parts used throughout.
- 31 STANDARD MODELS—to fit a wide variety of specifications.
- DRILLING CAPACITIES—from No. 60 to 1½" in Steel—rated to drill disintegration.
- FULLY ADJUSTABLE—from 1" min. to 14.2" max. 2 to 4 spindles.
- For Drilling, Reaming, Tapping and other machining operations.
- Prompt Delivery on Standard Heads.



Full Line of Standard Universal Adjustable and Special Fixed Center Drillheads . . . Automatic Reverse Tap or Drill Units. Write for the Thriftmaster Catalog.

Subsidiary of Thomson Industries, Inc.

Also makers of  
**DORMAN AUTOMATIC REVERSE TAPPERS**  
4 Sizes • Friction & Positive Drive Capacity  
No. 2-56 to 2" in Steel.

### THRIFTMASTER PRODUCTS CORPORATION

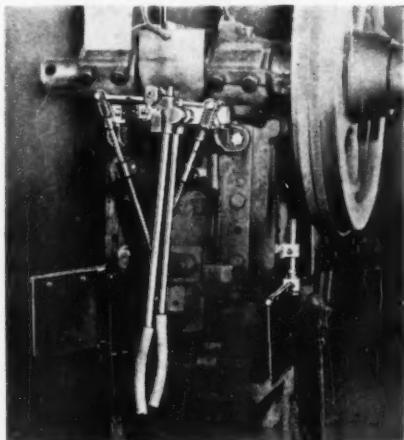
Division of Thomson Industries, Inc.

1030 N. PLUM STREET, LANCASTER, PA.

STANDARD UNIVERSAL ADJUSTABLE AND SPECIAL FIXED CENTER DRILLHEADS

fere with two-handed operation, important when the job requires "nesting" of the piece at each end.

As the ram descends, the two arms swing right and left respectively from their central position. The entire working area of the press is swept clear before the downward stroke has progressed far enough to close on fingers or hands. Each arm travels at only half the speed required by a single arm guard to cover the same area. This exclusive half-speed action eliminates any tendency to snap.



The Double-Arm Sweep-Type Guard is mounted on a hinged bar so that it can be swung to one side when the die setter is changing dies and making press adjustments. This feature eliminates the necessity of removing any part of the guard at any time. Once installed, it need never be taken off the press.

## DUAL CROSS and ROTARY FEED

### PALMGREN

### Rotary, Index MILLING TABLE

No. 83 Only \$54.50



Has 8" table, 360° movement and 4" cross feed travel. Adjusting wheels and dials graduated in degrees and thousandths. Slotted for bolting to table. No. 82 without rotary feed \$43.75.

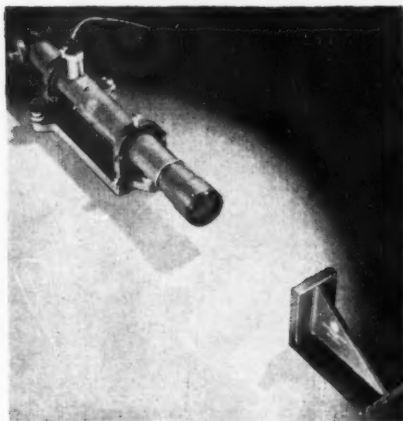
Write for Circular No. 354

**CHICAGO TOOL and ENGINEERING CO.**  
8384 South Chicago Ave. Chicago 17, Ill.

### Optical device measures displacements to .000025"

Improvements in the Watts 18" Microptic Auto-Collimator are announced by Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill., American distributors for Hilger and Watts, Ltd., London, England.

The Auto-Collimator determines and checks straightness, squareness, and inclinations to one-half second of arc (.000025" per inch of length). It operates upon the optical principle that a beam of light reflected by a mirror is deflected if the mirror is tilted and that the angle through which the reflected beam is turned is twice the angle of tilt of the mirror.



Through the micrometer eye-piece of the instrument, a reflected image of reference lines can be observed by which tilt is determined to an accuracy of a fraction of a second of arc.

A yellow filter and convenient scale provide for precise reading. The instrument has been accepted as standard by leading private and Government institutions. It is employed for gage and fixture inspection in the machine tool industry, and for the testing of precision mechanisms. Through the use of simple accessories, many accurate angular measurements can be made which can be converted conveniently into precise distance measurement.

## BARGAINS! LONG DRILLS

9" FLUTE  
12" HIGH SPEED 12"

Size	Price Each
1/8" x 12"	\$2.06
9/64" x 12"	2.06
5/32" x 12"	2.06
11/64" x 12"	2.06
3/16" x 12"	2.06
13/64" x 12"	2.19
7/32" x 12"	2.19
15/64" x 12"	2.40
1/4" x 12"	2.40
17/64" x 12"	2.55
9/32" x 12"	2.55
19/64" x 12"	2.75
5/16" x 12"	2.75
21/64" x 12"	3.11
11/32" x 12"	3.11
23/64" x 12"	3.46
3/8" x 12"	3.46
25/64" x 12"	3.81
13/32" x 12"	3.81
27/64" x 12"	4.17
7/16" x 12"	4.17
29/64" x 12"	4.52
15/32" x 12"	4.52
31/64" x 12"	4.52
1/2" x 12"	4.52

## DIAMONDS BARGAIN PRICES

KNOWN FOR THEIR PRECISION AND DEPENDABILITY.

### SAVE WITH EASTERN

Dress your wheels accurately with long lasting diamonds. Specify holder or nib required. No extra charge.

Carat	Price Complete
1/4	\$ 4.50
1/2	7.50
3/4	10.40
1	14.80
1 1/2	19.50
2	24.00
3	29.00
4	52.50

Send for Free Catalog 128 pages

**EASTERN**

**TOOL SUPPLY CO.**  
174 Grand St., N. Y., N.Y.

# **CERTIFIED** **Aircraft Surplus** **THREAD GAGES**

Plug—Ring—Roll Thread Snap Gages  
Plain Plugs—Plain Limit Snap Gages

Discount —      50%—Plug Gages  
                         30%—Ring Gages  
                         30%—Roll Thread  
                         Snap Gages

All gages certified before shipment and  
sold subject to customer acceptance

Stock list available upon request.

**JOHNSON - FAGG**  
**Engineering Co.**

3920 South Peoria

**TULSA, OKLAHOMA**

Phone 7-3337

P. O. Box 7157

# **ECONOMY** **HEADLESS AND** **SOCKET SET SCREWS**



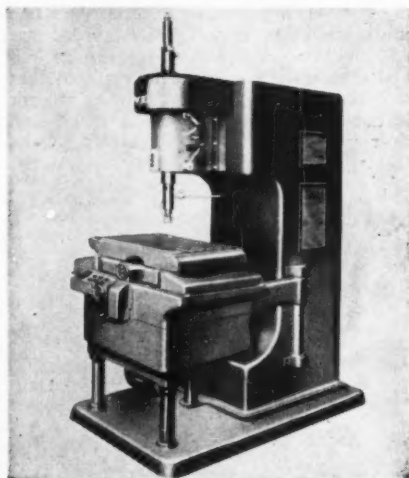
**TRY THEM ON YOUR**  
**NEXT JOB**

**ECONOMY MACHINE PRODUCTS**

8312 LAWRENCE CO. CHICAGO 30, ILL.

## **Compound-table tapping machine**

To facilitate precision tapping of a number of same-size holes on one or more levels in bulky pieces where use of multiple tapping heads is not practical, The Cleveland Tapping Machine Co., Canton, Ohio, offers its new Type ER compound-table Tapping Machine.



Moving on ball-bearing raceways, the 28"x42" work table has a lateral travel of 20" to either side, 13" forward travel and 11" backward travel from the normal standard position. This makes it possible to center any hole in a 24"x40" work piece directly under the tap. A push-button-controlled solenoid brake locks the table in any transverse and longitudinal position and holds it until released by pushing another button.

A motor-operated raising and lowering system, controlled by "up" and "down" levers, gives the table 18" vertical travel, with the table top 56" from floor at its maximum height. The elevating system consists of three Acme thread screws and ball-bearing mounted bronze nuts driven through steel sprockets by a continuous double roller chain to assure synchronization of the operation of all three screws.

The new machine employs the

**SAVE UP TO 85%  
ON TOOLS-MACHINERY  
AND PARTS!!**

**NEW!  
200 PAGE CATALOG**

**JUST OFF THE PRESSES! IMMEDIATE DELIVERY! ORDER NOW!!**

Our latest and biggest CATALOG of NEW and SURPLUS BARGAINS. Thousands of items at UN-HEARD OF LOW PRICES! SAVINGS UP TO 85% in Hand & Power Tools, Electrical Supplies, Industrial Machinery, Gas and Electric Motors, Winches, Hoists, Machine Tools, Gauges, Welding Equipment, Pneumatic & Air Tools, Raw Stocks, Aluminum, Brass, Copper, & Steel in Sheets, Bar, Rods, Tube & Extrusions, Nuts, Bolts, Rivets, Screws, Wire, Cable and a Huge Stock of HYDRAULIC SUPPLIES including Cylinders, Valves, Pumps, Motors, Fittings, Tubing, etc. While these items last we will continue to sell them at typical low Palley Prices. Write for your copy of this Bargain Packed Catalog TODAY!

**PALLEY SPECIALS on HYDRAULIC PUMPS & CYLINDERS**



**HYDRAULIC PUMP or MOTOR  
GEROTOR TYPE**

Lagan Gerotor type. For operating hydraulic systems on trucks, tractors, etc. Delivers 8 GPM at 1200 RPM at 1000 PSI with 5HP. Can also be used as hydraulic fluid motor. 3/8" stand pipe ports, 1/2" splined shaft for pulley or direct attachment. 5 1/2" dia., 7" long. Used but condition guaranteed.

**1950**



**P-3 STRATO POWER PUMP**  
With built-in variable flow control valve in head. Positive displacement piston type. Displacement capacity: 2 gal. per min. at 1500 RPM at 1250 PSI. Pressure limit 1250 PSI continuous, 1400 PSI for 15 sec. Operates at 3750 RPM, intermittent max., 4500 RPM. Rotates either direction without adjustment.

**1920**



**P-4 VICKERS ANGLE PUMP**  
Positive displacement type, angle piston. Displaces .507 cu. in. per revolution. Has capacity of 6 gal. per min. at 3000 RPM at 1500 PSI, continuous, 1875 for 15 sec. Operating speed of 3750 RPM, intermittent maximum, 4500 RPM. Rotates to the right only.

**1949**

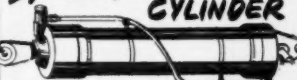
**STATIONARY or PORTABLE  
D.C. ARC WELDER**

For light or heavy industrial work. Delivers 300 Amps, continuous - or 350 to 400 Amps, intermittent. Designed to weld continuously for hours. This unit is built around a rugged, heavy duty, aircraft type generator and comes complete with Pulley reactor, output controls, Hi-Lo switches & rheostat mounted on sturdy steel frame. Operates on 15 H.P. for maximum output. Gas or electric motor.

**9750**



**Special! HYDRAULIC CYLINDER**



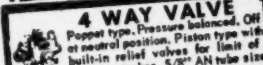
Gives 20,000 lb. thrust (push or pull) using 1500 PSI line pressure as obtained from our hydraulic pumps. Will produce up to 40,000 lb. thrust with 3000 PSI. Can also be used on low pressure air systems, 4" bore; 18" stroke; 30 1/2" length. Ideal for road-form - shop machinery.

**2995**



**No. 3 HYDRAULIC CYLINDER**  
Double action. Bore is 1 1/2" - Shaft 1/2". Has stroke of 2 1/2" to 4". Stroke can be adjusted with internal sleeve stops. Overall length is 8 1/2". Will take 1500 lbs. continuous duty, 3000 lbs. intermittent. Will lift or push up to 1100 lbs.

**575**



**4 WAY VALVE**  
Poppet type. Pressure balanced. Off at neutral position. Piston type with built-in relief valves for limit of cylinder strokes. 5/8" AN tube size (7/8"-14 thread) inlet & outlet. Ports to cylinder are 1/2" AN tube size (3/4"-16 thread).

**975**

**PALLEY  
SUPPLY CO.**

DEPT. MTB-1.  
4321 SAN FERNANDO RD.  
GLENDALE 1, CALIF.

Order from this ad. All sales final. All prices F.O.B., Glendale. Pay by M.O. or check. P.O.'s accepted from D.B.B. firms. 1/2 deposit with C.O.D.'s.

standard Type E Cleveland head, using hardened tool-steel lead screws and split bronze lead-screw nuts to insure maximum precision in high speed tapping. Provision is made for either manual or automatic cycling and limit switches are provided for tapping blind holes. Stroke is adjustable up to 5". The independent - motor - operated positive coolant and lubricant system has eight gallons capacity and volume, pressure and direction are easily controlled by the operator.

The base of the machine is 64" long and 38" deep. The column, 25" by 20", is 100" high approximately, with 26 1/2" throat depth to permit handling of work pieces overhanging the back of the table. The table top is precision-machined and provided with four tee-slots for mounting jigs, fixtures, and clamps.

The new machines are manufactured in a number of sizes for tapping holes 3/8" to 2 3/4", National Coarse Thread, in mild steel.

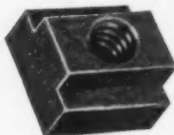
# First in STAMPINGS IN SMALL LOTS

Short Runs

Precision Die Made — Lowest Possible Cost.

**DAYTON ROGERS MFG. CO.**  
Minneapolis 7, Minn.

SEND FOR FREE CATALOG TODAY



**T-NUT & STUD SETS  
STEP BLOCK SETS  
PUNCH PRESS SETS**

QUARTER TURN SCREWS  
SHOULDER SCREWS  
DOUBLE END JIG FEET  
SCREW TYPE JIG FEET  
PRESS TYPE JIG FEET  
FLANGED NUTS  
CUT THREAD STUDS  
TEE-NUTS  
COUPLING NUTS  
ADJUSTABLE STEP BLOCKS  
STAR TYPE HAND KNOBS  
HEXAGON TYPE HAND KNOBS  
KNURLED HEAD SCREWS

*Northwestern*

118 HOLLIER AVE., DAYTON 3, OHIO

## FREE bulletin!

"What you should know  
about LIVE CENTERS"



**FALLS PRODUCTS INC.** 122 Genoa St.  
GENOA, ILL.



**T-NUTS  
STUD SETS**

**STRAP CLAMPS**

**SURE GRIP STOP BLOCKS**

**TIETZMANN TOOL CORP.**  
Englewood, Ohio

# CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

We solicit your inquiries.

**BLOOMFIELD TOOL CORP.**

36 FARRAND ST. BLOOMFIELD, N. J.

## Want the best?



*Specify* **ACE**  
DRILL BUSHINGS

- 3/4 MILLION BUSHINGS IN STOCK in your assurance of prompt service
- WEST COAST AERO TOOL'S REPUTATION is your guarantee of highest quality
- HIGHEST QUALITY TOOL AND ALLOY STEELS provides extreme durability and longer life
- PRECISION MADE — LIGHT-WAVE TESTED for .0003 maximum tolerance

AFFILIATE  
MEMBER  
A.S.T.E.

**ACE DRILL BUSHING CO.**

1401 MOUNTAIN AVENUE HO 9-8253 LOS ANGELES 27



## KING PORTABLE BRINELL

for all **HARDNESS  
TESTING**, Throat 4",  
Gap 10", Wt. 27  
lbs. — **ACCURATE**

Puts actual load of  
3000 KG on 10 mm. ball.  
Test head removable for  
testing very large parts

**ANDREW KING**

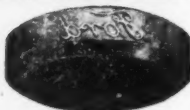
521 Broad Acres Road  
Narbeth, Pa.



## Have You a MARKING PROBLEM?



Steel stamp and dies;  
roller dies, emboss-  
ing dies; machine en-  
graving. Dies and  
Plates. Write for cat-  
alog.



Mfrs. Since 1893

## MERKERT AND SONS

146-16 JAMAICA AVE., JAMAICA 2, N.Y.

# THE MARKET PLACE

FOR EMPLOYMENT AND SALES SERVICES

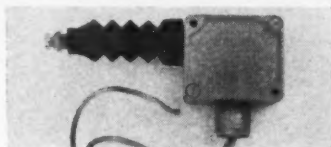
## Dovetail, Flat and Circular Form Tools, Reamers, Counterbores

*Prompt, Efficient Service  
Attractive Prices*

Send Your Inquiries to —

**ANDERSONS, INC.**

6603 W. Diversey Ave., Chicago 35, Illinois



### MICRO SWITCHES—

PLUNGER OPERATED WATER PROOF—  
DUST PROOF. 4 POLE. IDEAL FOR START-  
ING OR STOPPING SMALL MOTORS ON  
DRILL PRESSES, LATHES, FLOAT-PUMPS  
ETC. \$3.00 EACH POSTPAID. DISCOUNT  
ON QUANTITIES.

**N. M. JONES**

P.O. Box 1653

SARASOTA, FLA.

## MR. JOBBER OR DEALER

Are you looking for a new line which stimulates  
sales and is profitable? An independent manu-  
facturer of a cutting compound, wants repre-  
sentation for a coolant which has withstood all  
competition.

write **INSTA COOLANT**

1016 Pawnee St.

Kansas City, Kan.

## I. E. AVAILABLE

Age 35. I. E. Degree. Seven years exp.  
as Exec. Asst. and Consultant to top  
Management in Tool and Metal In-  
dustries. Now \$7000.

R-1624 Scientists' & Engineers' Ass'n.  
CEDAR GATE, DARIEN, CONN.

## FOR SALE

Machine shop with fully developed  
patented machine. See ad in Sept. issue  
of B.B. page 215. Reason for Sale: Lack  
of production facilities and sufficient  
capital.

Write Dept. HH

**c/o Machine & Tool Blue Book**  
222 E. Willow Ave. Wheaton, Ill.

## SALES OPPORTUNITY!

Manufacturer's agents wanted to represent fast  
selling machine tool item, selling to both distri-  
butors and industrial users. Increased machine  
shop activity makes this item a sure-shot sales  
and profit opportunity.

Wire or write Box 53

**c/o HITCHCOCK PUBLISHING CO.**  
WHEATON, ILLINOIS

## PRODUCT DESIGN & DEVELOPMENT ENGINEERS Wanted

Age 25 to 60. Minimum 3 years design  
experience, preferably in printing, of-  
fice equipment or business machines.  
Research, design, develop, organize,  
execute. \$4180 to \$6396. Ohio. (No.  
2024).

## Scientists' and Engineers' Ass'n.

(Placement Agency)

28 Rock Rimmon Rd. Stamford, Conn.

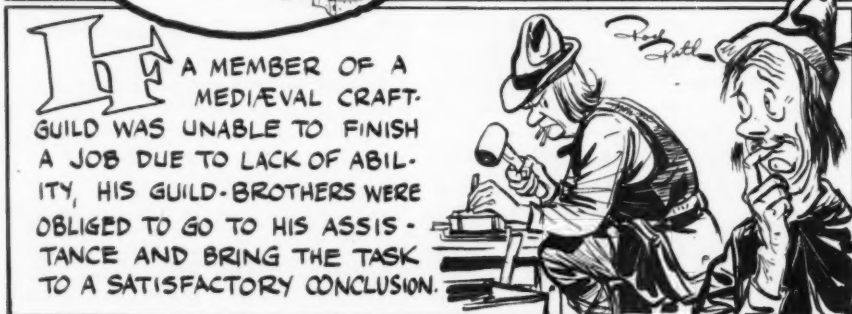
## DEALER OR JOBBER

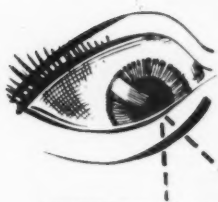
We have a practical, low cost, time-saving Speed  
Reducer. It is attached to drill presses and saves  
many man-hours of labor in drilling, tapping, and  
reaming. New and saleable. Repeat orders coming  
in. Get details from

**LOUIS NEWMAN MACHINERY CO.**

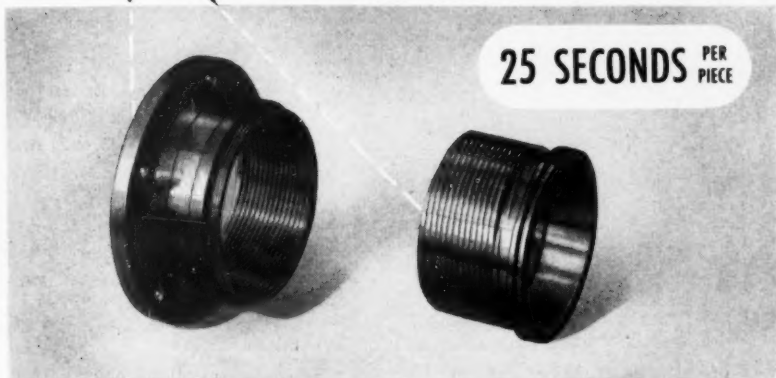
8-10 STEARNS SQ. SPRINGFIELD, MASS.

# Mechanics Through The Ages





## FOCUS YOUR EYE on these THREADING FIGURES!



### FOCUSING NUT & SCREW

Material Aluminum — 545 RPM — 10P

Length  $\frac{1}{2}$ " — 6-Threads — Tool HSS



## IT'S A "SURE SHOT"

that these high speed threading figures will start you wondering if you are losing out by not putting Cri-Dan Single Point Threading to work on your threading jobs. Tool cost averages only \$3.20 . . . changeover time is only 15 minutes . . .

average workers produce precision threads.

Cri-Dan Single Point Threading is obsoleting former threading methods in industry from coast to coast. Ask for Bulletin 85-A . . . it's loaded with Cri-Dan facts and figures!

Contact your  
Lees-Bradner  
representative  
or write direct to

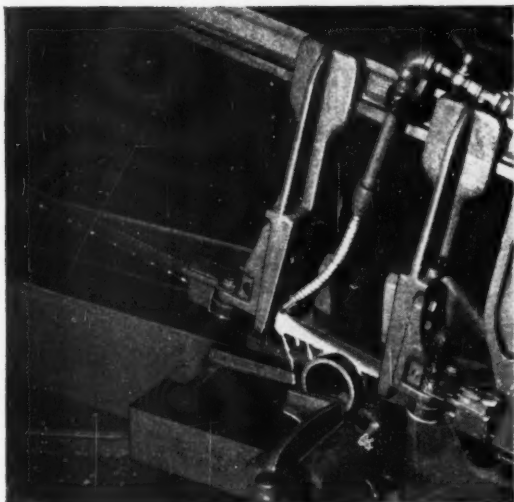
*The* **LEES-BRADNER** *Company*

CLEVELAND 11, OHIO, U. S. A.

# WHATEVER YOU NEED, YOU'LL FIND IT HERE

## P R O D U C T S I N D E X

- Abrasive Belt Machines, 28, 304
- Abrasive Cloth, Paper, Disc, Belts, Wheels, Stones, Etc., 65, 84, 85, 243
- Abrasive Cutting Machines, 40, 241
- Adapters, 15, 363
- Air Control Equipment, 253, 355
- Air Line Fittings, 89, 355
- Air Operated Equipment, 31, 60, 74, 79, 137, 233, 279, 381
- Alloys, 118, 139
- Angle Attachments, 78
- Angle Dressers, 314
- Angle Vises, 151
- Angles, 234, 299, 361
- Anti-Friction Compound, 63, 276
- Backrests, Roller, 94
- Bags, Shipping, 56
- Bakelite Gears, 238
- Balancing Machines, 25
- Balancing Ways, 316, 332
- Band Sawing Machines, 91, 95
- Bar Machines, Automatic, 185
- Bearings, Thrust, 352
- Benchies, Work, 21
- Bending Equipment, 29, 52, 101, 123, 204, 269, 321
- Bits, Tool, 15, 81
- Blade Holders, 94
- Blades, Scraper, 316
- Blanks, Carbide, 67
- Bolts, Coupling, 331
- Bolts, Eye, 361
- Books, 139, 193
- Boring Bar Holders, 147
- Boring Bars and Tools, 41, 64, 66, 75, 122, 146, 147, 323, 336, 340
- Boring, Drilling & Milling Attachments, 64, 66
- Boring, Drilling & Milling Machines, 41, 294
- Boring Heads, 78, 323, 336
- Boring Mills, Horizontal, 100
- Boxes, Cardboard, 99
- Brakes, Press and Bending, 11, 123, 321
- Broaches, 76, 143
- Broaching Attachments, 76, 358
- Broaching Machines, 76, 358
- Buffing Machines, 26, 39, 384
- Burring Machines and Tools, 245, 291
- Burs, Carbide, 247
- Bushings, Drill Jig, 46, 226, 257, 310, 335, 360, 368
- Bushings, Jig and Fixtures, 328
- Bushings, Pilot, 199
- Bushings, Rotary, 336
- Calipers, 324, 352, 354, 356
- Cam Milling Service, 313, 356, 362, 368
- Carbide Tools, 13, 67, 139, 143, 193, 247, 320, 334, 336
- Case-Hardening Compound, 329
- Castings, 228, 272
- Centering Machines, 101, 136
- Centers, Lathe, 221
- Centers, Live, 221, 253, 283, 322, 364, 368
- Chain Making Machinery, 256
- Chains and Sprockets, 54, 93
- Chamfering Tools, 143
- Chasers, 352
- Checking Equipment, 299, 316, 332
- Chisels, 206
- Chucking and Indexing Fixtures, 358
- Chucking Machines, 185
- Chucks, 19, 28, 136, 320, 351
- Chucks, Air Operated, 19, 137, 233, 381
- Chucks, Automatic, 189
- Chucks, Boring, 302
- Chucks, Collet, 220, 320
- Chucks, Cone Jaw, 262
- Chucks, Diaphragm, 72
- Chucks, Drill, 28, 189
- Chucks, Lathe, 19, 28, 157, 220, 351
- Chucks, Magnetic, 83, 157
- Clamps, 236, 360
- Clamps, Fixture, 210
- Clamps, Jaw, 202, 334
- Clamps, Strap, 368
- Clamps, Toggle, 236
- Clinchers, 58
- Clutches, 277, 375
- Collet Fixtures, 197, 238
- Collet Tubes, 155, 197
- Collets, 3, 155, 197, 220, 283, 320, Back Cover
- Contract Work, 124, 125, 233, 280, 313, 356, 358, 362, 368
- Control Valves, 106, 303, 317
- Controls, Automatic, 252
- Coolant Systems, 265
- Cotter Pins, 336
- Counterbores, 45, 313
- Countersinks, 303, 337
- Couplings, 89, 93, 277
- Cut-off Blades, 303
- Cut-off Machines, 40, 101, 241, 309, 341
- Cutter Sharpening Machines, 12
- Cutters, Rod, 29, 123, 267, 319
- Cutting Fluid and Oils, 153, 362
- Cutting Tools, 146, 193, 202, 233, 239, 247, 319, 336, 337, 342, 362, 377
- Cylinders Hydraulic and Pneumatic, 58, 79, 137, 217, 367, 381
- Demagnetizers, 157
- Depth Gauges, 160
- Dial Indicators, 98
- Diamond Compound, 237, 243
- Diamond Powder, 243, 358
- Diamond Tools, 57, 197, 296, 311, 314, 358, 365
- Diamond Wheels, 296, 311, 358
- Diamonds, Industrial, 365
- Die Filers, 353
- Die Holders, 94
- Die Makers' Supplies, 191
- Die Making Machines, 187, 298, 330
- Die Sets, 191, 356
- Dies, 1, 45, 53, 69
- Dies, Adjustable, 1
- Dies, Carbide, 53
- Dies, Perforating, 1
- Dies, Roller and Stamping, 104
- Dividing Heads, 157, 306
- Dowel Pins, 271, 328
- Draw Bars, 283, 342
- Dressing Fixtures, Grinding Wheel, 202, 302, 314
- Drill Chip Breakers, 327
- Drill Dispensers, 214
- Drill Heads, 160, 218, 327, 352, 364
- Drill Heads, Multiple Spindle, 160, 218, 327, 352, 364
- Drill Holders, 94
- Drilling Attachments, 33, 254, 290, 327, 343, 353
- Drilling Machine Parts, 363
- Drilling Machines, Multiple Spindle, 18, 43, 69, 339
- Drilling Machines, Radial, 102, Inside Back Cover
- Drilling Machines, Sensitive, 129
- Drilling Machines, Upright, 102
- Drilling Machines, Variable Speed, 129, 343
- Drilling and Tapping Units, 69, 107, 294, 354
- Drilling Units, Automatic, 245, 354
- Drill Press Feeds, 381
- Drills, 45, 239, 303, 334, 365, 377
- Drills, Core, 239
- Drills, High Speed, 365, 377
- Drills, Masonry, 303
- Drills, Spade, 239
- Drills, Twist, 81
- Drivers, Tool, 15
- Drives, Motor, 314, 353
- Duplicating Attachments, 77, 162
- Duplicating Machines, 77, 115, 298
- Dust and Fume Control Equipment, 55, 74, 248, 285
- Dye, Layout, 318, 319
- Elevators, Portable, 322
- Embossing Machines, 104



*The Mark of Superiority*



## **They're cutting more for less in thousands of metalworking plants**

Ask the men who use them — and the men who check on costs. They'll tell you that Millers Falls metal-cutting bands mean more production at lower costs — faster, better work — longer blade life.

The special formula steels that go into Millers Falls bands are part of the secret. But more important still are the precision heat-treating methods. These unique processes produce extreme tooth hardness without sacrificing toughness — result in tremendous cutting ability and at the same time high resistance to breakage and wear.

That's why Millers Falls bands are paying off in thousands of metalworking plants. Write for full details, or let us arrange a convincing demonstration.

**MILLERS FALLS COMPANY**  
Greenfield, Mass.

### **Millers Falls Metal-Cutting Bands Give You All These Advantages**

1. Millers Falls Bands are part of the world's broadest and most highly developed line of metal-cutting saws.
2. A complete line — the right blade for every type of job and every material.
3. Available cut and pre-welded to fit any machine — or in coils of 100 ft. and up.
4. Packed in separate cartons, clearly marked for easy identification and storage.

End Mills, 45, 117, 342  
Engraving Machines, 255, 298, 337, 349  
Eye Bolts, 361

Face Plate Jaws, 19  
Facing Tools, 34, 313, 340, 348  
Feed Fingers, 197  
Feeds, Hopper, 351  
Feeds, Press, 35, 215, 347, 354  
Feeders, Work, 381  
Feeler Gauge Stock, 331  
Files, 206, 303  
Files, Rotary, 13, 206, 303  
Filing Machines, 91, 95, 158, 330  
Films, 320  
Filters, Air, 60  
Filters, Air Line, 355  
Fittings, Tube, 137  
Fixture Clamps, 210  
Fixture Parts and Fittings, 210, 260  
Flexible Shaft Equipment, 13, 14, 22, 27, 242  
Flexible Shaft Machines, 14, 22, 27, 242  
Floaters, Sheet, 230  
Floats, Welded, 317  
Floor Surfacing, 270  
Follower Machines, 77  
Forgings, 301  
Form Tools, Circular, 143  
Fuller's earth, 270  
Furnaces, Heat Treating, 61, 96, 286, 293, 295

Gage Accessories, 91, 95  
Gage Blocks, 91, 95  
Gages, Dial, 98, 181, 281, 348, 367  
Gages, Plug, 343, 362, 366  
Gages, Precision, 72, 257, 343  
Gages, Snap, 181, 281, 362, 366  
Gages, Thread, 366  
Gang Cutters, 143  
Gear Checkers, 172, 173  
Gear Cutting Machines, 136, 172, 173, 353  
Gear Hobbing Machines, 124, 125  
Gear Hobbs, 143  
Gear Shaper Cutters, 143  
Gear Shaving Machines, 169, 172, 173  
Gears, 93, 143, 238, 356  
Gears, Bevel, 93, 356  
Gears, Spiral, 356  
Grilles, 240  
Grinder-Millers, 134  
Grinders, Abrasive Band, 26, 304  
Grinders, Air, Portable, 31, 251, 279, 355  
Grinders, Bench, 26, 39, 73, 211  
Grinders, Carbide Tool, 339  
Grinders, Centerless, 8, 9, 148, 149  
Grinders, Chip Breaker, 339  
Grinders, Contour, 91, 95  
Grinders, Disc, 39  
Grinders, Drill, 12, 39, 187, 363, 384  
Grinders, External or Internal, 338  
Grinders, Face Mill, 187  
Grinders, Hack Saw Blade, 280  
Grinders, Knife and Blade, 216  
Grinders, Micro-centric, 8, 9  
Grinders, Pedestal, 39, 211  
Grinders, Profile, 8, 9, 353  
Grinders, Semi-automatic, 148, 149  
Grinders, Snagging, 26, 39  
Grinders, Surface, 91, 95, 109, 111, 300  
Grinders, Tap, 12  
Grinders, Template Tool, 187  
Grinders, Thread, 311  
Grinders, Tool & Cutter, 26, 39, 73, 187, 212, 219, 357, 363, 384  
Grinders Tool Room, 26, 211, 363, 384  
Grinders, Wet or Dry, 39, 339  
Grinding Fixtures, 86, 202, 306  
Grinding Service, 362  
Grinding Spindles, 10  
Grinding Wheel Holders, 97  
Grinding Wheels, 65, 84, 85, 97  
Groove Pins, 329  
Grooving Tools, 340  
Guards, Press, 294  
Guide Fixtures, Tap, 309  
Guns, Air, 60

Hammers, Pneumatic, 362  
Handles, Machine, 299  
Hardness Testing Equipment, 201, 368  
Hinges, 350, 358  
Hobbing Machines, 124, 125  
Hobs, 45, 124, 125, 143

Holders, Floating Drill, 304  
Hole Finishing Tools, 356  
Hole Location Accessories, 51  
Hole Punching Equipment, 176, 177  
Hollow Mills, 313  
Honing Fixtures, 379  
Honing Machines, 379  
Honing Tools, 291, 358, 379  
Hydraulic Equipment, 29, 58, 137, 217, 367

Index Fixtures and Tools, 33, 364  
Indexing Machines, 69  
Indicator Holders, 315  
Indicators, Precision Test, 356  
Inspection & Measuring Devices, 98, 201, 234, 254, 281, 299, 343, 354, 356

Jig Bore, 51  
Jig Boring Attachment, 64, 183, 304, 360  
Jig Boring Services, 313  
Jig Feet, Double End and Screw Type, 368  
Jig Grinding Attachment, 183  
Jigs and Fixtures, 72, 299, 350, 353  
Joints, Universal, 15, 93

Keys, Woodruff and Machine, 310, 329, 336  
Keyseaters, 219, 356  
Keyway Cutting Equipment, 86, 117  
Knobs, Machine, 299, 368  
Knurling Tools, 94, 310

Lapping Equipment & Compounds, 237, 325, 345  
Lapping Machines, 8, 9, 148, 149, 172, 173, 362

Lapping Tools, 291  
Lathe Attachments, 3, 77, 134, 147, 292  
Lathe Center Lubricants, 276  
Lathe Dogs, 4  
Lathes, Automatic, 25, 59, 86  
Lathes, Bench, 89  
Lathes, Engine & Toolroom, 7, 47, 80, 207, 222, 254, 274, Inside Back Cover  
Lathes, Precision, 2, 47, 207, 211, 222, Inside Back Cover  
Lathes, Speed, 221, 287  
Lathes, Turret, 23, 25, 57, 80, 90, 308  
Lay-out Dies, 318, 319  
Lettering Machines, 82, 356  
Lighting Equipment, 224, 347  
Lubricants, 63, 276  
Lubricators, 355

Machine Racks, 310, 336  
Machine Parts, 329, 338  
Magnetic Base Holders, 315  
Magnifiers, Binocular, 297  
Mandrels, Expanding, 317  
Marking Machines, 82, 104, 307, 356, 368  
Micrometers, 324, 354  
Milling Cutters, 34, 45, 143, 204, 313, 336, 342  
Milling Machine Attachments, 64, 66, 78, 86, 117, 134, 147, 151, 183, 254, 266, 353, 360  
Milling Machines, 8, 9, 41, 78, 135, 136, 227, 258, 299, 348  
Milling Machines, Bench, 33, 62, 219, 244  
Milling Machines, Contour, 251  
Milling Machines, Hand, 38, 227, 348  
Milling Machines, Turret, 78  
Milling Machines, Vertical, 254, 348  
Mills, Face, 34  
Motor Drives, 314, 353  
Motors, Air, 74, 251  
Motors, Electric, 251, 303, 367  
Mounted Wheels, 84, 85

Name-Plate Marking Machines, 307  
Notching Equipment, 123, 176, 177, 257  
Nuts, Flanged, 21, 368

Oil Groovers, 338  
Oilers, Spindle, 338  
Oilers, Stock, 289  
Optical Inspection Devices, 297

Pantographs, 115  
Parallels, 145, 202, 234, 299, 361  
Partitions, Wire Mesh, 311  
Perforated Units, 240  
Pillow Blocks, 93, 272  
Pilot Bushings, 199  
Pinion Turning Machines, 48, 49

# YOUR SAVINGS

will GROW and GROW and GROW



- least power consumption
- least power waste
- lowest upkeep

## CONWAY CLUTCH

**"The Clutch of Robust Refinement"**

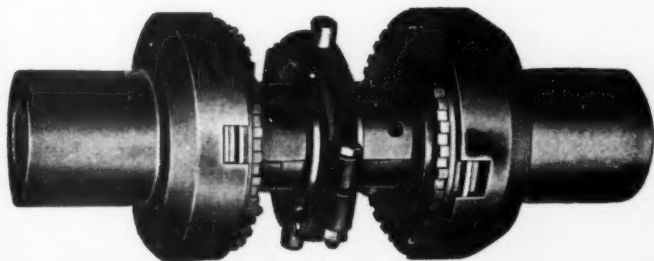
NOW when the "emergency" calls for supreme efforts, these clutches answer the call zealously. Reliable . . . standardized, interchangeable parts . . . built of basic materials . . . a size and type for every purpose.

**precision-  
built for  
rugged  
performance**

...  
designed for  
practical appli-  
cation in every  
industry . . .  
engineered to  
meet every de-  
mand for effec-  
tive production

**WRITE FOR  
NEWEST  
BULLETINS  
NOW READY**

**The CONWAY CLUTCH CO. 1105 MARSHALL AVE.  
CINCINNATI 25, OHIO**



**Conway  
Double-  
Throw  
Clutch**

- Pipe Bending Machines, 52, 269  
Pipe Cutting Machines, 309  
Pipe Notchers, 257  
Plates, Angle, 254  
Plates, Surface, 234, 299, 361  
Polishers, Drill, 208  
Polishing Tools, 291  
Portable Air Tools, 31, 251, 262, 279  
Portable Electric Tools, 262, 291, 384  
Precision Parts, 72  
Precision Tools, 234  
Press Attachments, 55, 36, 134, 205, 215, 257  
294, 307, 314, 345, 354, 360  
Press Guards, 294  
Presses, Air, 32, 92, 137  
Presses, Arbor, 32, 92, 317  
Presses, Automatic, 246  
Presses, Bench Radial Drill, 131  
Presses, Deep Throat, 213, 244, 305  
Presses, Drill, 18, 32, 80  
Presses, Foot, 32, 256  
Presses, Forging, 20  
Presses, Forming, 112, 140, 141  
Presses, Horn, 140, 141, 305, 317  
Presses, Hydraulic, 20, 92, 112, 137, 316  
Presses, O. B. I., 36, 305  
Presses, Power, 32, 36, 50, 215, 230, 246, 256, 268, 317  
Presses, Punch, 244, 305  
Presses, Straightening, 92, 316  
Presses, Turret Punch, 50  
Profiling Machines, 101, 349  
Protective Devices, 281, 332  
Pulleys, Variable Speed, 228, 272  
Pumps, Air, 74  
Pumps, Coolant & Lubricant, 137, 205, 265, 273, 367  
Punch Press Sets, 368  
Punches, 123, 206, 232, 296  
Punches and Dies, 232  
Punches, Ball Bearing, 225  
Punching Units, 9, 176, 177, 213  
Pusher Tubes, 155, 373  
Pyrometers, 355
- Racks, 277  
Radius Tools, 311, 314  
Reamer Holders, 364  
Reamers, 45, 363, 362  
Recessing Tools, 94  
Rectifiers, 157  
Reel Stands, 179, 256, 307, 347  
Regulators, 60, 61, 355  
Retaining Rings, 161  
Rivet Setters, 30  
Riveting Machines, 58, 146, 217, 318, 359  
Rod Parters, 123  
Roll Feeds, 179, 347, 354  
Roller Backrests, 94  
Roller Dies, 164, 368  
Rolls, Bending, 20  
Routers, 251, 349
- Safety Devices, 261, 294, 345, 382  
Sand Blasts, 74  
Saw Blades, Band, Inside Front Cover, 42, 91, 95  
Saw Blades, Hack, Inside Front Cover, 87  
Sawing Machines, Band, Inside Front Cover, 32, 88, 91, 95, 158  
Sawing Machines, Circular, 258  
Sawing Machines, Cut-off, 341  
Sawing Machines, Hack, Inside Front Cover, 157, 268, 325, 341  
Saws, Hole, Inside Front Cover, 373  
Scraper, Hand and Power, 316  
Screw Drivers, Power, 351  
Screw Machine Attachments, 3, 94  
Screw Machine Products, 338  
Screw Machines, Automatic, 23, 258  
Screw Machines, Hand, 62  
Screw Sets, Transfer, 357, 362  
Screws, Cap, Set, Socket & Machine, 331, 366, 367, 368  
Services: Milling, Grinding, Lapping, Rebuilding, Repairing, Business, etc., 233, 260, 264, 289, 313, 356, 358, 362, 368  
Set-Up Equipment, 145, 360  
Shapers, 11, 213, 251, 268  
Shapers, Bench, 80  
Sharpeners, Hack Saw, 280
- Shearing Machines, 11, 29, 44, 123, 140, 141  
Shears, Slitting, 281  
Shears, Squaring, 32  
Sheet Floaters, 230  
Sheet Metal Machinery, 140, 141  
Shim Stock, 351  
Shop Tools, 303, 334, 367  
Sine Bars, 234  
Sleeves, Square Holed, 284  
Slide Forming Machines, 256  
Slitting Machinery, 281  
Slitting Attachments, 162  
Sockets, 15, 301  
Spacers, Arbor, 349  
Special Machinery, 25, 26, 76, 218, 258, 294, Inside Back Cover  
Special Tools, 45, 143, 218, 233, 264, 299, 313  
Spindles, 10, 338  
Spot Facers, 167  
Spotters, 316  
Sprockets, 54  
Staking Machines, 359  
Stampings, 368  
Stamps, Steel, 104, 312, 324, 368  
Steel and Steel Stock, 76, 71, 91, 95, 118, 126  
Stop Block Set, 368  
Stop Blocks, 368  
Stock Pushers, 155  
Stops, Lathe, 94, 368  
Straight Edges, 361  
Straighteners, Wire, 256, 267  
Strainers, 333  
Stud Setters, 15  
Studs, 331, 368  
Superfinishers, 25  
Surface Finish Standards, 12  
Switches, Demagnetizing, 157
- Tables, Elevating, 322  
Tables, Rotary & Index, 362, 364  
Tap Chucks, 15  
Tap Guide Fixtures, 309  
Tap Holders, 94  
Tap Sharpeners, 12  
Taper Pins, 310, 329  
Tappers, 327, 364  
Tapping Attachments, 13, 290, 327, 364  
Tapping Heads, 208, 327  
Tapping Machines, 23, 24, 129, 167, 185, 208, 354  
Tapping and Threading Machines, 24  
Taps, 13, 16, 17, 45, 159  
Temperature Controls, 252  
Test Indicators, 356  
Thinners, Drill Point, 187  
Thread Milling Machines, 12  
Thread Rolling Machines, 6  
Threading Machines, 23, 24, 167, 371  
T-Nut and Stud Sets, 368  
Tool Cribs—Wire Mesh, 341  
Tool Designing, 260, 289  
Tool Holders, 4, 15, 304, 342  
Tool Posts, 94  
Tracer Controlled Equipment, 115  
Transformers, 61, 252  
Traps, Steam and Air, 317  
Trunnions, Indexing, 33  
Tube & Pipe Bending Machines, 101, 269  
Tubing Notchers and Cutters, 257  
Turning Machines, 48, 49  
Turning Tools, 94, 340  
Turrets, Bed, 292  
Turrets, Lathe, 292  
Type Holders, 104
- Valves, 79, 106, 137, 205, 213, 217, 233, 253, 333, 367, 381  
Verniers, 160, 324, 352, 356  
Vise Jaws, 202  
Vises, Bench and Machine, 19, 60, 78, 151, 157, 158, 277, 334, 350, 357, 359, 360, 361
- Welding Equipment & Supplies, 133, 313, 367  
Wheel Dressers, 202, 302, 311  
Wheels, Hand, 299  
Wire Cutters, 319  
Wire Forming Machines, 204, 356  
Wire Mesh Partitions, 341  
Work Holders, 360  
Wrenches, 15, 301

*Victor's Specials Deserve Your Attention!*

# HIGH SPEED DRILLS

## Extra Long Length

### IMMEDIATE DELIVERY

#### Straight Shank No. 1 - 60

No. By Gage	Length Inches	Our Price Each Net
1 to 10	6 1/4	\$1.00
11 to 20	5 3/4	.90
21 to 30	5 3/8	.80
31 to 40	5 1/4	.70
41 to 50	4 1/2	.60
51 to 60	3 1/2	.50

#### Straight Shank

Size Inches	Length Overall Inches	Length Flute Inches	Price Each Net
1/8	12	9	\$1.65
9/64	12	9	1.65
5/32	12	9	1.65
11/64	12	9	1.65
3/16	12	9	1.65
13/64	12	9	1.80
7/32	12	9	1.80
15/64	12	9	1.95
1/4	12	9	1.95
17/64	12	9	2.05
9/32	12	9	2.05
19/64	12	9	2.25
5/16	12	9	2.25
21/64	12	9	2.50
11/32	12	9	2.50
23/64	12	9	2.75
3/8	12	9	2.75
25/64	12	9	3.05
13/32	12	9	3.05

Size Inches	Length Overall Inches	Length Flute Inches	Price Each Net
27/64	12	9	\$3.30
7/16	12	9	3.30
29/64	12	9	3.60
15/32	12	9	3.60
31/64	12	9	3.60
1/2	12	9	3.60

#### Taper Shank

17/32	15	12	\$7.15
9/16	15	12	7.70
19/32	15	12	8.25
5/8	15	12	8.80
21/32	15	12	9.00
11/16	15	12	9.10
23/32	15	12	9.35
3/4	15	12	9.50
25/32	15	12	10.50
13/16	15	12	12.00
27/32	15	12	12.65
7/8	15	12	13.20
29/32	15	12	13.75
15/16	15	12	14.30
31/32	15	12	15.40
1	20	15	17.60
1-1/16	20	15	18.70
1-1/8	20	15	19.80
1-3/16	20	15	22.00
1-1/4	20	15	24.00



**VICTOR MACHINERY EXCHANGE, INC.**

DEALERS IN TOOL ROOM EQUIPMENT

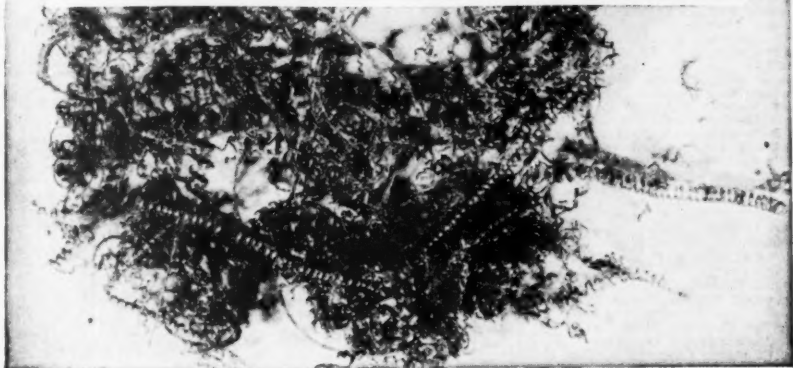
251-A Centre St. • New York 13, N. Y. • Phone: CAnal 6-5575

# Index to Advertisers

A. K. Tool Company	292
Accurate Bushing Company	46
Ace Abrasive Laboratories	243
Ace Drill Bushing Company	368
Acme-Danneman Company, Inc.	356
Acme Industrial Company	328
Acme Tool Company	291
Acme Wire & Iron Works	341
Acorn Bearing Company	352
Acromark Company	356
Adamas-Carbide Corp.	67
Aget-Detroit Company	285
Air-Way Pump and Equipment Company	253
Alina Corp.	354
Allegheny Ludlum Steel Corp.	70-71
Allison Collet Manufacturing Company, Inc.	155
Allison Chuck Products	220
American Air Filter Co.	55
American Broach and Machine Co.	76
American Chain & Cable (Wilson Mechanical Instrument Div.)	241
American Chain & Cable	201
American Machine and Foundry Co.	189
American Pipe Bending Machine Co.	189
American Society of Tool Engineers	195
American Tool Works	Inside Back Cover
Ames Company, B. C.	98
Anderson Brothers Manufacturing Company	316
Andersons, Inc.	389
Apex Machine & Tool Co.	15
Armstrong-Blum Manufacturing Company	Inside Front Cover
Armstrong Brothers Tool Company	4
Atlantic Gear Works	356
Atlantic Saw Mfg. Co., Inc.	42
Atlas Press Co.	18
Auto Moulding & Manufacturing Company	350
Automatic Steel Products, Inc.	167
Baldor Electric Company	73
Balmar Corp. (N. A. Strand Div.)	22
Barber-Colman Company	124-125
Barker Engineering Company	219
Bath Company, John	16-17
Benchmark Manufacturing Company	244
Benco Collet Manufacturing Company	Back Cover
Beverly Shear Manufacturing Company	281
Billings & Spencer Company	301
Blair Tool and Machine Corp.	362
Blake Company, Edward	12
Blanchard Machine Company	97
Bloomfield Tool Corp.	368
Boice Manufacturing Company	348
Boston Gear Works	93
Bridgeport Machines Incorporated	78
Brinnell Company	261
Brown Corporation, W. R.	60
Brown & Sharpe Manufacturing Company	48-49
Brown Engineering Company	277
Buchanan Chemical Co., C. G.	329
Buckeye Tool Corporation	262
Buffalo Forge Company	29
Buffington Made-Rite Box Company	99
Burg Tool Manufacturing Company	69
Busch Company, J. C.	361
Campbell Machine Division (American Chain & Cable)	241
Capitol Machinery Corp.	131
Carboloy Company	320
Carborundum Company	65
Carroll and Jamieson Machine Tool Company	254
Chandler Tool Company	340
Chicago Die Casting Manufacturing Company	272
Chicago Manufacturing and Distributing Co.	63
Chicago Rivet & Machine Company	30
Chicago Tool & Engineering Company	364
Chicago Wheel & Manufacturing Company	84-85
Cincoel Division (Cincinnati Milling Machine Company)	153
Cincinnati Bickford Tool Company	102
Cincinnati Electrical Tool Company	384

Cincinnati Grinders, Inc.	8-9
Cincinnati Lathe and Tool Company	7
Cincinnati Milling Products Division (Cincinnati Milling Machine Company)	153
Cincinnati Shaper Company	11
Clark, James	362
Cleco Division (Reed Roller Bit Co.)	89
Cleveland Crane and Engineering Company	44
Cleveland Tapping Machine Company	167
Cleveland Twist Drill Company	81
Coffey-Cummins Manufacturing Company	334
Colborne Manufacturing Company	221
Colonial Bushings, Inc.	360
Columbus Die-Tool & Machine Company	289
Combination Vise and Jig Company	350
Comet Tool Company	122
Commander Manufacturing Company	327
Comtor Company	343
Conant Tool and Engineering Company	358
Conner Tool & Cutter Co.	239
Continental Machine Company	309
Conway Clutch Company	375
Cook and Chick Company	351
Cooley Electric Mfg. Corp.	246
Coca Corporation	383
Covel Manufacturing Company	109
Craley Manufacturing Company, C. C.	336
Criterion Machine Works	323
Cushman Wheel Company	54
D. & M. Guard Company	294
Dahistro Manufacturing Company	309
Dake Engine Company	92
Danly Machine Specialties, Inc.	191
Dayton Rogers Manufacturing Company	368
Dearborn Company, J. W.	358
Derbyshire, Inc., F. W.	211
Detrol Stamping Company	349
Di Machine Corporation	16
Diamond Tool Research Company, Inc.	353
Diehl Machine Works, G. M.	90
Dixon Crucible Company, Inc., Joseph	276
DoAll Company	91-95
Donovan Manufacturing Company	360
Dreis & Krump Manufacturing Company	321
Durant Tool Supply Company	319
Dykem Company	319
Eastern Tool Supply Company	365
Economy Machine Products Company	366
Economy Tool & Machine Company	257
Edroy Products Company	297
Eisler Engineering Company, Inc.	313
Electro-Mechano Company	343
Elgin Tool Works	62
Enco Manufacturing Co.	315
Engis Equipment Company	237
Errington Mechanical Laboratory, Inc.	290
Ettco Tool Co.	185
Excelsior Tool & Machine Company	213
Falls Products Company	368
Fanco Machine Company	32
Farmington Diamond Tool Company	296
Fosteria Pressed Steel Corp.	224
Froom and Company, R. H.	361
Fulfillo Specialties Company	205
Fulmer Company, C. Allen	379
Galland-Henning Manufacturing Company	79
Gatco Rotary Bushing Company	336
General Die and Stamping Company	283
Genesee Manufacturing Company	313
Giddings and Lewis Machine Tool Company	41
Gillen Company, John	329
Gisholt Machine Company	147
Globe Heat-Seal, Inc.	147
Golconda Corp.	37
Gorton Machine Company, George	115
Grant Manufacturing & Machine Company	146
Gray Mills Corp.	285
Greaves Machine Tool Company	288
Green Instrument Company	349

**Believe it or not . . .**  
**THESE ARE HONING CHIPS**



**FULMER**

**HONING MACHINES REMOVE  
METAL SO RAPIDLY THAT ONLY**

**ROUGH BORING OR DRILLING IS NEEDED  
BEFORE HONING**

**FULMER COMPLETE  
HONING EQUIPMENT  
Has EVERYTHING  
YOU NEED IN ONE  
"PACKAGE"—Honing  
Machines—Tools—  
Fixtures**

Think of the terrific savings in time and labor! In Fulmer Honing Machines the spindle rotating and reciprocating mechanism provide honing of geometrical accuracy and any desired degree of smoothness. The rapid cutting action removes large amounts of material quickly, as shown in the photograph.

*How to hone faster and more accurately is described in Bulletin 10. Please write for your copy.*

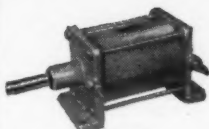
**C. ALLEN FULMER CO.**

**1242 First National Bank Bldg.  
Cincinnati 2, Ohio**

Grob Brothers	158
Grobet File Company of America	357
Hall Manufacturing Company	320
Hamilton Tool Company	129
Hammond Machinery Builders	339-363
Hanchett Magna-Lock Corporation	83
Hanna Engineering Works	217
Hardinge Brothers, Inc.	3
Hargis Manufacturing Corporation	35
Harrington and King Perforating Company	240
Hartmann Manufacturing Company	359
Harvey Manufacturing Corporation	330
Haskins Company, R. G.	27
Hayfred Co.	311
Heimann Manufacturing Company	357
Heller Brothers Company	206
Hendey Machine Company	207
Heuser Manufacturing Company	353
Hevi Duty Electric Company	61
High Speed Hammer Company	359
Hirschmann Company, Carl	24
Hisey-Wolf Machine Company	39
Hogson and Pettis Manufacturing Company	312
Hoswald Machine Works, W. T.	336
Huot Manufacturing Company	214
Huppert Company, K. H.	293
Hypneumat, Inc.	354
Hy-Pro Tool Company	159
Industrial Products Suppliers	331
Insta-Coolant (James West)	369
J & S Tool Company, Inc.	202
Jacobs Manufacturing Company	28
Jarvis Company, Chas. L.	13
Jergens Company, J. G.	199
Jiffy Manufacturing Company	56
Johnson and Bussell	352
Johnson-Farr Engineering Company	366
Johnson Gas Appliance Company	286
Johnson Machine & Press Corp.	345
Johnson Manufacturing Corp.	88
Jones, Nelson M.	369
Junkin Safety Appliance Company	382
Kearney & Trecker Corp.	135
Kennametal, Inc.	193
Kent-Owens Machine Company	227
King, Andrew	368
Koenig Co., William A.	160
L-W Chuck Company	157
LaBahn Machine and Manufacturing Co.	354
LaPeer Manufacturing Company	236
Lansy Tool Company	360
Last Word Sales Company	302
Lee Company, K. O.	212
Lees-Bradner Company	371
Leiman Brothers, Inc.	74
Leominster Tool Company	333
Lewthwaite Machine Company, T. H.	319
Lincoln Electric Company	133
Linley Brothers Company	318
Logan Engineering Company	47
Logansport Machine Company	137
Lovejoy Tool Company	34
M. B. Products Company	355
McDonough Manufacturing Co.	219
Machine Products Corp.	299
Madison-Kipp Corporation	279
Magie City Machine Tool Company	145
Manufacturers Cutter Corp.	233
Maquoketa Company	341
Marshalltown Manufacturing Company	317
Master Manufacturing Company	86
Maxwell Company	75
Mead Specialties Company	381
Mercol Corp.	252
Merkert and Sons	368
Mettler Machine Tool, Inc.	267
Meyers and Company, W.	225
Michigan Chrome & Chemical Company	318
Michigan Drill Head Company	160
Michigan Tool Co.	172-173
Mico Instrument Company	298
Midwest Tool & Engineering Company	322

Millers Falls Co.	373
Moline Tool Company	294
Moore Special Tool Company	31
Morey Machinery Company	37-100-348
Morton Machine Works	210
Motch & Merryweather Machinery Co., The	268
Mummert-Dixon Company	348
National Broach and Machine Company	169
National Machine Tool Company	366
National Tool Company	143
Nelise, Karl A.	146-352
New Hermes, Inc.	255
Newman Machinery Co., Louis	369
New Method Steel Stamps, Inc.	324
Niagara Machine & Tool Works	140-141
Nichols Engineering Company	314
Nichols-Morris Corporation	306
Nicholson & Company, W. H.	317
Nielsen, Incorporated	322
Nielsen Tool and Die Company	362
Nilson Machine Company, A. H.	256
Nirrol Manufacturing Company	253
Nobels Manufacturing Company	245
Northwestern Tool & Engineering Company	368
Norton Company	148-149
Oliver Instrument Company	187
O'Neil-Irwin Manufacturing Company	123
Onsrud Machine Works	251
Ottumiller Company, Wm. H.	331
Palley Supply Company	367
Pannier Corp.	104
Parker Machine Company, Inc.	213
Pedrick Tool and Machine Co.	52
Perkins Machine Company	36
Pines Engineering Company	101
Pivot Punch and Die Corp.	352
Plunket Machine Company, J. E.	352
Pope Machinery Corporation	107
Pratt and Whitney	247
Precise Products Company	134
Preis Engraving Machine Co., H. P.	337
Proconer Safety Chuck Company	268
Product Machine Company	35
Pruett Machinery Company, D. H.	6
Putnam Tool Company	117
Pyott Foundry and Machine Company	228
Pyrometer Instrument Company	355
Quality Chaser Company	352
Queen City Machine Tool Company	211
R and L Tools	91
Reading Machine Company	356
Ready Tool Company	221
Redmer Air Device Corporation	233
Reed Roller Bit Company	89
(Cleco Division)	
Reich Manufacturing Company, J. R.	356
Reid Brothers Company	300
Reltool Corp.	342
Rice Pump and Machine Company	353
Richards Company, J. A.	204
Rimat Machine Tool Co.	281
Ring Punch and Die Company	236
Rivett Lathe and Grinder, Inc.	334
Rockford Machine Tool Company	162
Rodgers Hydraulic, Inc.	20
Rogers and Company, Samuel C.	216
Roll Feeds Corporation	347
Root Co., B. M.	339
Ross Operating Valve Company	106
Rotor Tool Company	31
Rouse and Company, H. B.	38
Royal Products	364
Royersford Foundry and Machine Company	325
Rulets Company	307
Rusnok Tool Works	66
Ruthman Machinery Company	273
Rutland Tool Service	264
Ryerson & Son, Inc., Joseph T.	118
S & S Hinge & Metal Products Company	358
Sales Service Machine Tool Company	268
Sanford Manufacturing Corporation	111
Schauer Manufacturing Corp.	287
Scherr Company, Inc., Geo.	324-356

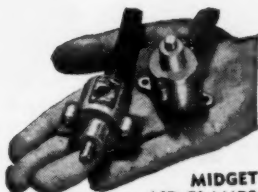
# NEW MEAD INDUSTRIAL AIR POWER CATALOG Ready!



AIR CYLINDERS



AIR  
VISES



MIDGET  
AIR-CLAMPS\*



PNEUMATIC  
WORK FEEDERS



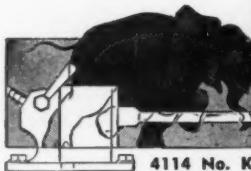
AIR  
PRESSES

*Full of Suggestions*  
**for FASTER, CHEAPER  
PRODUCTION!**

Illustrates, describes Air Cylinders, Valves, air operated Presses, Vises, Chucks, Hammers, Drill Press Feeds, Work Feeders, Timers, semi-automatic combinations, etc.

*\*Pneumatic Cylinders*

*Write for Complete Catalog!*



## MEAD

SPECIALTIES COMPANY

4114 No. Knox Ave., Dept. YA-121, Chicago 41, Ill.

**THIS**



**FREE BOOK**

**CAN HELP**

**PREVENT THIS**

Especially written for safety inspectors and maintenance supervisors directly responsible for the safety of press operators, "Power Press Protection" is yours for the asking. Contains valuable information on the maintenance and safe operation of power presses. Send for your copy today.



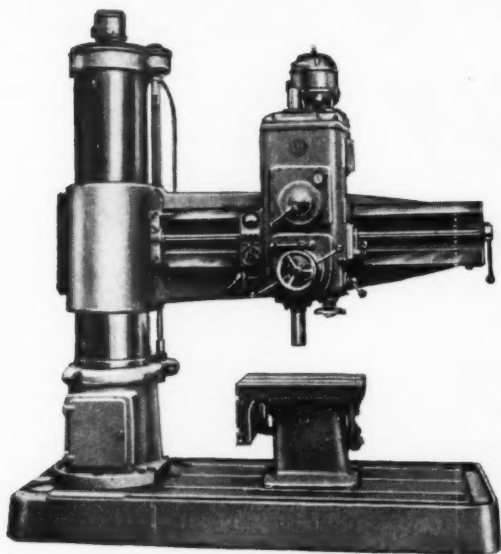
**JUNKIN SAFETY APPLIANCE CO.**

101 S. Floyd

LOUISVILLE 8, KENTUCKY

Schlecht & Sons, Inc., L. G.	356
Schmidt, Inc., George T.	32-307
Schultz and Anderson Company	271
Scientists' and Engineers' Association	369
Seibert and Sons, Inc.	363
Sellew Machine Tool Company	352
Seneca Falls Machine Company	59
Service Machine Company	305
Sheffer Collet Company	197
Sheldon Machine Company	274
Sibley Machine & Foundry Company	283
Sid Tool Company	310
Sidney Machine Tool Company	222
Simmons Machine Tool Corp.	308
Simonds Saw and Steel Company	87
Simonski Co., Gilbert S.	96
Skinner Chuck Company	19
South Bend Lathe Works	86
Speedgrip Chuck Inc.	351
Sperman Metal Specialties	314
Standard Electrical Tool Company	26
Standard Gage Company	181
Standard Horse Nail Corporation	336
Standard Pressed Steel Company	31
Standard Steel Specialty Company	310
Standard Tool Co.	45
Standard Transmission Equipment Company	353
Stone Machinery Company	40
Stow Manufacturing Co.	242
Strand and Company, N. A.	
(Div. Balmar Corp.)	22
Stuart Oil Company, D. A.	363
Sturdy Broaching Service	284
Sundstrand Machine Tool Company	332
Swartz Tool Products Company, Inc.	260
T & T Tool Company	303
Taft-Petree Manufacturing Company	234
Tammis Industries, Inc.	234
Thriftmaster Products Corp.	364
Tietzman Tool Corp.	368
Timesaver Products Company	345
Tomkins-Johnson Machine Company	58
Torit Manufacturing Company	248
Tres Tool and Die Works	64
Troyke Manufacturing Company	362
Turchan Follower Machine Company	77
Twentieth Century Mfg. Company	362
U. S. Automatic Box Machinery Company	254
U. S. Machine Tool Company	348
U. S. Products Co.	325
U. S. Steel Supply Co.	126
Universal Engineering Company	335
V & O Press Company	215
Vascoloy-Ramet Corp.	139
Verson Allsteel Press Company	230
Victor Machinery Exchange	377
Viking Industries	299
Vinco Manufacturing Company	347
Vogel Tool & Die Corporation	257
Vulcan Tool Company	183
Wade Tool Company	2
Waldes-Kohinoor Inc.	161
Wales-Strippit Corporation	176-177
Walls Sales Corporation	304
Walsham Machine Works	353
Wardwell Manufacturing Company	280
Warner & Swasey Company	23
Watts Bros. Tool Works	356
Wesson Products Co.	151
Whistler and Son, S. B.	1
White Dental Manufacturing Co., S. S.	14
Whitney Metal Tool Company	225
Whitton Machine Company	336
Wileco Machine Corporation	338
Wiedemann Machine Company	50
Wilson Company, K. R.	112
Wilson Mechanical Instrument Div.	201
(American Chain & Cable)	
Witte Manufacturing Company	179
Woodworth Co., N. A.	72
Yost Manufacturing Company	158
Zagar Tool Company	218
Ziegler Tool Company, W. M.	304

# KOLB RADIAL DRILLS FOR LIGHT · MEDIUM · HEAVY DUTY



Model NKR-53 Kolb Radial Drill has 12 speeds from 30 to 1500 R.P.M. and 12 feeds from .003" to .118" per rev.

## FOR ACCURATE PRODUCTION

- Heavy bases, columns and arms—Rigidly constructed
- Column diameters from 7½" to 35"
- Flanged motor mounted on top of spindle head
- Hardened and ground gears
- Hardened and ground spline shafts rotating on ball bearings

## FOR SPEEDIER PRODUCTION

- Selector device for pre-setting speeds and feeds
- Rigid locking of column and spindle head by electro-hydraulic clamping system (automatically or by hand)
- Push button controls
- Automatic depth release

## FOR YOUR PRODUCTION

- Maximum drilling capacities in cast iron—1½" to 8" diameter
- Maximum drill radii—27" to 180"
- Spindle speeds—12, 24 or 36—from 30 to 3000 R.P.M.
- Feeds—6, 9, 12 or 18—from .0012" to .1181" per rev.

**THERE IS A KOLB RADIAL FOR YOUR DRILLING JOB  
LET COSA QUOTE ON YOUR SPECIFIC NEEDS**

**COSA CORPORATION**  
405 Lexington Ave., New York 17

IN DETROIT AREA contact DETROIT-COSA CORPORATION, 16923 James Couzens Highway, Detroit 35, Mich.

Your source for all Precision Machine Tools—  
from Small Bench Lathes to Large Boring Mills

# A REAL GRINDER

*and a*  
**REAL  
BARGAIN**

- Full 1 H.P. Motor
- Two 10" x 1" Grinding Wheels
- Exhaust Outlets on Wheel Guards
- All Angle Tool Rests
- Fabricated Steel Pedestal
- 20" Between Wheels
- Ball Bearing Construction

*Also Furnished In  
Bench Type*



**WRITE** for name of nearest  
distributor or Bulletin 51 LB

MFRS. OF DRILLS, GRINDERS, BUFFERS AND PORTABLE TOOLS

TRADE

*The Cincinnati*

MARK

**THE CINCINNATI ELECTRICAL TOOL CO.**

Division of THE R. K. LeBLOND MACHINE TOOL CO.

CINCINNATI 8, OHIO, U. S. A.

# 72 hrs. of heat treatment

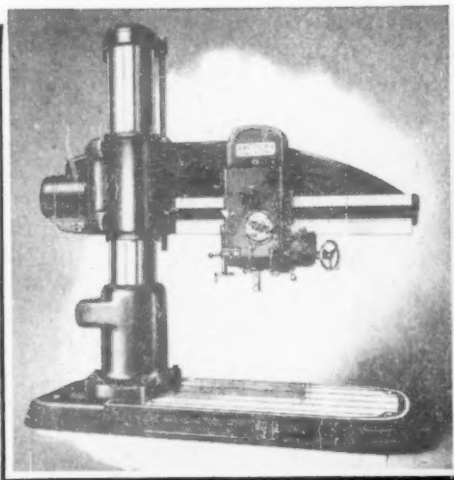
... required to produce the ultimate  
in radial drill spindles

"AMERICAN" Radial Drill Spindles are made of nitralloy. 70 hours of heat treatment from rough to finish, then 72 hours of nitriding are required to produce the wear-resistant spindles used in these radials.

Both the spindles and sleeves are nitrided to 110 degrees scleroscope. This is harder than some grades of cemented carbide. The sleeve is finish honed and the spindle ground and then diamond lapped to a sliding fit in the sleeve. Because of the lack of affinity between these two hard surfaces the clearance between them may be reduced to the very minimum, which in this case is .00025".

This results in the greatest possible stability, resulting in an ideal construction especially for accurate boring operations, which demand a high degree of smoothness and rigidity of the spindle.

This is but one of the super features that make the "AMERICAN" Hole Wizard an outstanding investment.



**THE AMERICAN TOOL WORKS CO.**

**Cincinnati, Ohio U.S.A.**

*Lathes and Radial Drills*

*There's a*

# BENCO PUSHER



**that  
will do your  
particular job  
better**

● When a question arises concerning the proper type of pusher to use, the answer is "there is a Benco Pusher that will do your particular job better!" Among the many types of Benco Pushers are solid, squirrel cage, heavy duty cage type, "Multi-Split" and Master with alloy pads.

In order to provide proper spring tension and a hard bearing area only selected bar stock is used. In addition, the bearing sections are accurately hardened, assuring long lasting, trouble-free operation. Thread tolerances are carefully checked to insure snug fit in the feed tube.

Benco Pushers always feed smoothly and properly without damaging the stock. With Benco Pushers you get more production and reduce stock waste on simple feeds or difficult work such as high speeds, long feed-outs and scratchless operations.

For twenty-five years, leading manufacturers have been producing more and better work with Benco Collets and Pushers. It will pay you to specify Benco if you want to increase the performance of your machines. Most standard sizes are carried in stock for immediate delivery.



SEND FOR  
OUR CATALOG  
AND PRICE LIST

## BENCO COLLET MANUFACTURING CO.

1561 EAST 27th STREET

CLEVELAND 14, OHIO

*Always Better Constructed*  
**Accurate Benco Collets, Pushers and Pads**